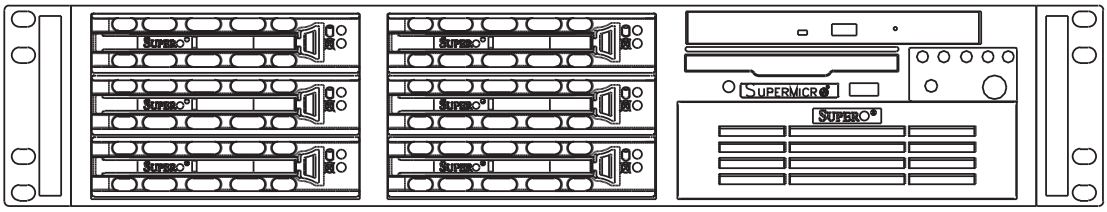
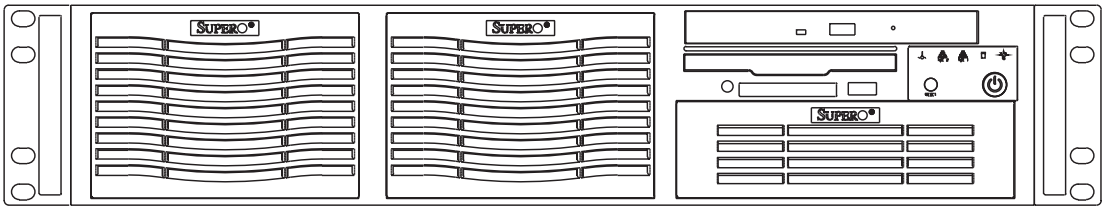
SUPERO

SUPERSERVER 5025M-4+
SUPERSERVER 5025M-i+





USER'S MANUAL

1.0

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Manual Revision 1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5025M-4+/5025M-i+. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5025M-4+/5025M-i+ is a high-end, dual Pentium processor rackmount server based on the SC823S-550LP/SC823i-550LP 2U rackmount server chassis and the PDSM4+/PDSME+ motherboard, which supports single Intel PentiumD, Pentium4 or CeleronD type processors. Refer to the motherboard specifications pages on our web site for updates on supported processors.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the PDSM4+/PDSME+ motherboard and the SC823S-550LP/SC823i-550LP chassis, which make up the SuperServer 5025M-4+/5025M-i+.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5025M-4+/5025M-i+ into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5025M-4+/5025M-i+.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the PDSM4+/PDSME+ motherboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC823S-550LP/SC823i-550LP 2U server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI or peripheral drives and when replacing the system power supply unit and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: Software Installation

Appendix D: Adaptec HostRAID Setup Guidelines

Appendix E: System Specifications

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Chapter 1

Introduction

1-1 Overview

The Supermicro SuperServer 5025M-4+/5025M-i+ is a high-end, 2U rackmount server that features some of the most advanced technology currently available. The SuperServer 5025M-4+/5025M-i+ is comprised of two main subsystems: the SC823S-550LP/SC823i-550LP 2U chassis and the PDSM4+/PDSME+ Pentium processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 5025M-4+/5025M-i+. (www.supermicro.com)

In addition to the motherboard and chassis, various hardware components may have been included with your SuperServer 5025M-4+/5025M-i+, as listed below:

- One (1) 3.5" floppy drive [FPD-PNSC-02(01)]
- One (1) slim CD-ROM drive [CDM-TEAC-24(B)]
- Four (4) 8-cm chassis cooling fans (FAN-0070)
- Rackmount hardware (with screws):
  Two (2) rack rail assemblies
  Six (6) brackets for mounting the rack rails to a rack/telco rack
- SCSI Accessories (5025M-4+ only):
  Six (6) SCA drive carriers [CSE-PT17(B)]
  One (1) SCA SAF-TE compliant SCSI backplane (CSE-SCA-822S)
  One (1) internal 68-pin Ultra320/160 SCSI cable (CBL-033L-U320)
- SCSI Accessories (5025M-i+ only):
  Two (2) hard drive carriers supporting up to 6 hard drives [CSE-PT18(B)]
  One (1) SATA power cable (CBL-0082)
  Four (4) SATA data cables (CBL-0044)
- One (1) active heatsink, optional (SNK-P0015A4)

- One (1) CD containing drivers and utilities
- SuperServer 5025M-4+/5025M-i+ User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 5025M-4+/5025M-i+ lies the PDSM4+/PDSME+, a single Intel Pentium processor motherboard based on the Intel® 3010 chipset and designed to provide maximum performance. Below are the main features of the PDSM4+/PDSME+. (See Figure 1-1 for a block diagram of the chipset.)

Processors

The PDSM4+/PDSME+ supports single a Intel E6000 & E4000 sequence, PentiumD (Dual-Core), Pentium4 Extreme Edition, Pentium 4, Pentium Extreme Edition or CeleronD LGA775 processor at system bus speeds of 1066, 800 and 533 MHz. Please refer to the motherboard specifications pages on our web site for updates on supported processors.

Memory

The PDSM4+/PDSME+ has four 240-pin DIMM slots that can support up to 8 GB of unbuffered ECC/non-ECC DDR2-667/533/400 SDRAM.

Onboard SCSI (5025M-4+ only)

Onboard SCSI is provided with an Adaptec AIC-7901 SCSI controller chip, which supports dual channel, Ultra320 SCSI at a burst throughput rate of 320 MB/sec. The PDSM4 provides two SCSI ports.

PCI Expansion Slots

The PDSM4+/PDSME+ has one PCI-Express x8 slot, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and two 64-bit 100 MHz PCI slots (one functions as a ZCR slot). The SC823 chassis accommodates up to seven low profile add-on cards.

Graphics Controller

The PDSM4+/PDSME+ features an integrated video controller based on the ES1000 graphics chip. The ES1000 was designed specifically for servers, featuring low power consumption, high reliability and superior longevity.

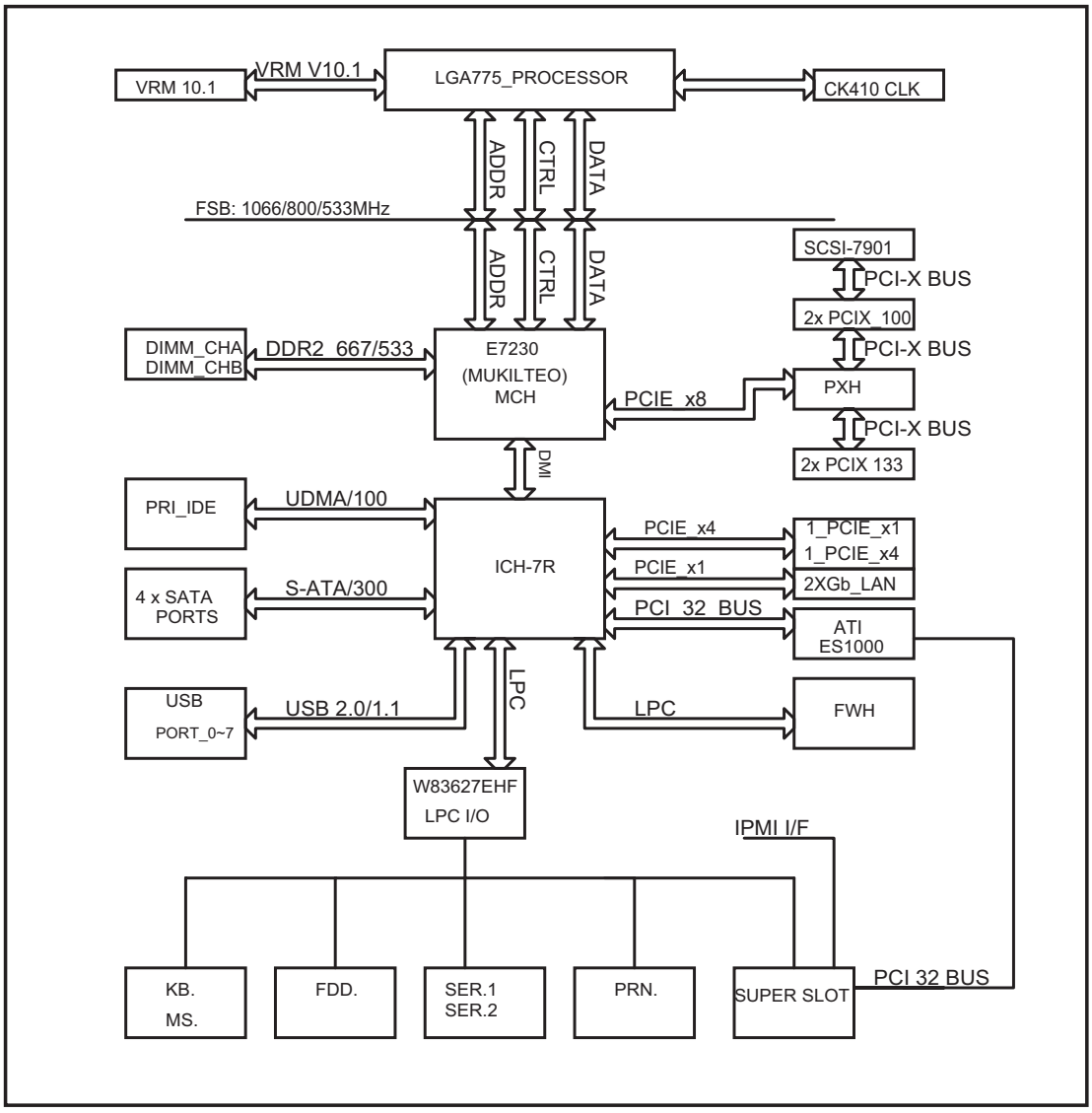
Onboard Controllers/Ports

The PDSM4+/PDSME+ includes one floppy drive controller and one onboard ATA100 IDE channel. Backpanel I/O ports include one COM port, two USB ports, PS/2 mouse and keyboard ports, a video (monitor) port and dual Gigabit Ethernet LAN ports. The PDSM4 also includes an external SCSI port.

Other Features

Other onboard features are included to promote system health. These include various voltage monitors, a CPU temperature sensor, fan speed sensors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

Figure 1-1. Intel E7230 Chipset: System Block Diagram



Note: This is a general block diagram. Please see Chapter 5 for details.

1-3 Server Chassis Features

The following is a general outline of the main features of the SC823S-550LP/SC823i-550LP chassis.

System Power

When configured as the 5025M-4+/5025M-i+, the SC823S-550LP/SC823i-550LP chassis includes a single 550W power supply.

SCSI Subsystem (5025M-4+ only)

The SCSI subsystem supports six 80-pin SCA Ultra320 SCSI hard drives. (Any standard 1" drives are supported. SCA = Single Connection Attachment.) The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings. The SCSI drives are also hot-swap units.

Control Panel

The SC823S-550LP/SC823i-550LP control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and system overheat conditions. Also present are a main power button and a system reset button.

I/O Backplane

The backplane of the SC823S-550LP/SC823i-550LP supports the use of up to seven low-profile expansion cards and provides one COM port, one VGA port, two USB ports, PS/2 mouse and keyboard ports and two Gb Ethernet (LAN) ports.

Cooling System

The SC823S-550LP/SC823i-550LP chassis' revolutionary cooling design that includes four 8-cm system cooling fans. The fans plug into chassis fan connectors that are located behind the drive bays. A "Fan Speed Control Mode" setting in BIOS allows the user to set the chassis fan speed [recommended setting is "4-pin (Server)]". If any fan fails and the ambient air temperature inside the chassis becomes too high, an overheat LED and alarm will be activated. The system also includes an air shroud to maximize airflow efficiency.

1-4 Contacting Supermicro

Headquarters

Address: SuperMicro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

Europe

Address: SuperMicro Computer B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands
Tel: +31 (0) 73-6400390
Fax: +31 (0) 73-6416525
Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific

Address: SuperMicro, Taiwan
4F, No. 232-1, Liancheng Rd.
Chung-Ho 235, Taipei County
Taiwan, R.O.C.
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3991
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: 886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5025M-4+/5025M-i+ up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your SuperServer 5025M-4+/5025M-i+ system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a motherboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 5025M-4+/5025M-i+ was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 5025M-4+/5025M-i+. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 5025M-4+/5025M-i+ was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SCSI drives and power supply units to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

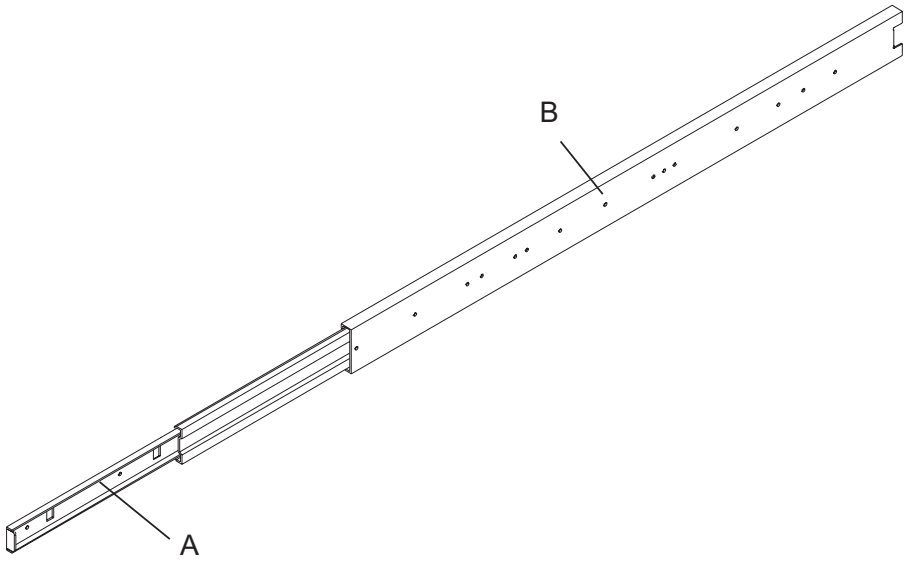
This section provides information on installing the SuperServer 5025M-4+/5025M-i+ into a rack unit. If the 5025M-4+/5025M-i+ has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 5025M-4+/5025M-i+ into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the SuperServer 5025M-4+/5025M-i+. Each of these assemblies consist of three sections: an inner fixed chassis rail that secures to the 5025M-4+/5025M-i+ (A) and an outer fixed rack rail that secures directly to the rack itself (B). A sliding rail guide sandwiched between the two should remain attached to the fixed rack rail. (See Figure 2-1.) The A and B rails must be detached from each other to install.

To remove the fixed chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Then depress the locking tab to pull the inner rail completely out. Do this for both the left and right side rack rail assemblies.

Figure 2-1. Identifying the Sections of the Rack Rails



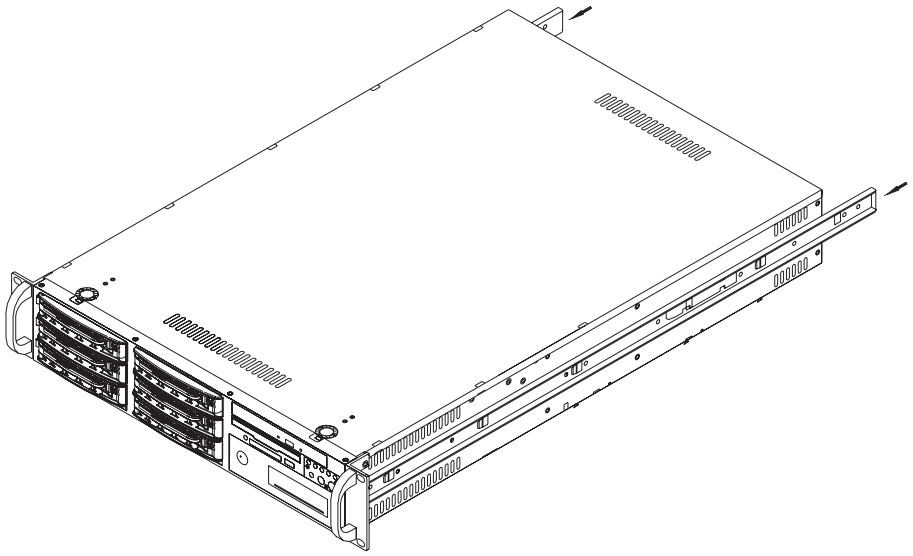
Installing the Chassis Rails

Position one of the fixed chassis rail sections you just removed along the side of the 5025M-4+/5025M-i+. Note that these two rails are left/right specific. Slide the rail toward the front of the chassis (see arrows in Figure 2-2) until you hear them click into place with the retention hooks on the chassis. The screw holes should now be aligned - screw the rail securely to the side of the chassis (see Figure 2-2).

Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installng into a telco rack.

Locking Tabs: As you have seen, both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing Chassis Rails



Installing the Rack Rails

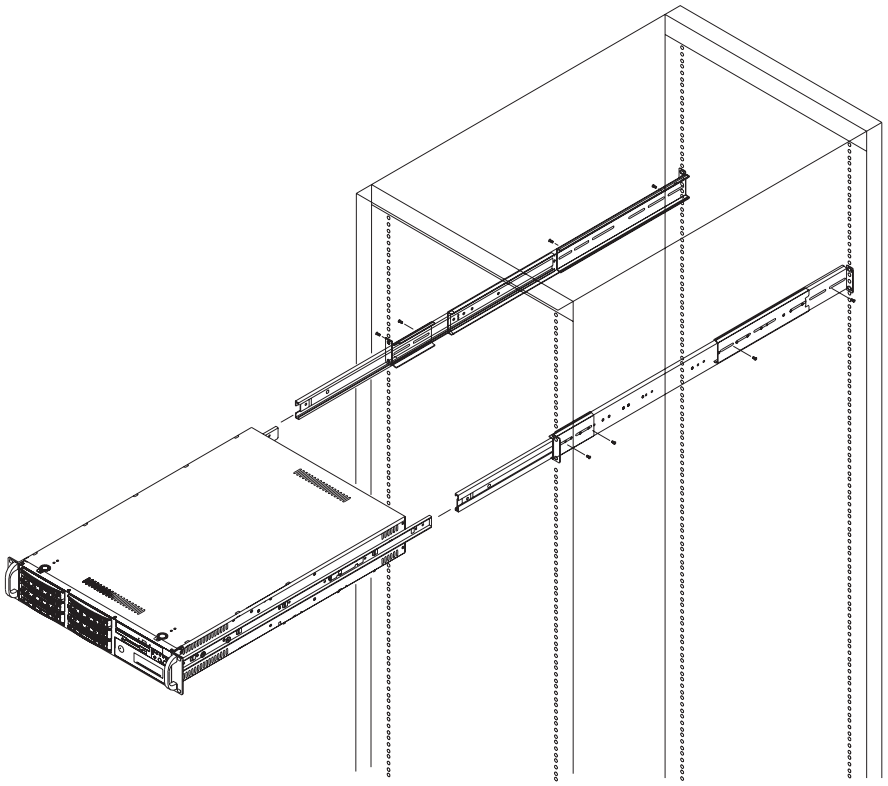
Determine where you want to place the SuperServer 5025M-4+/5025M-i+ in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

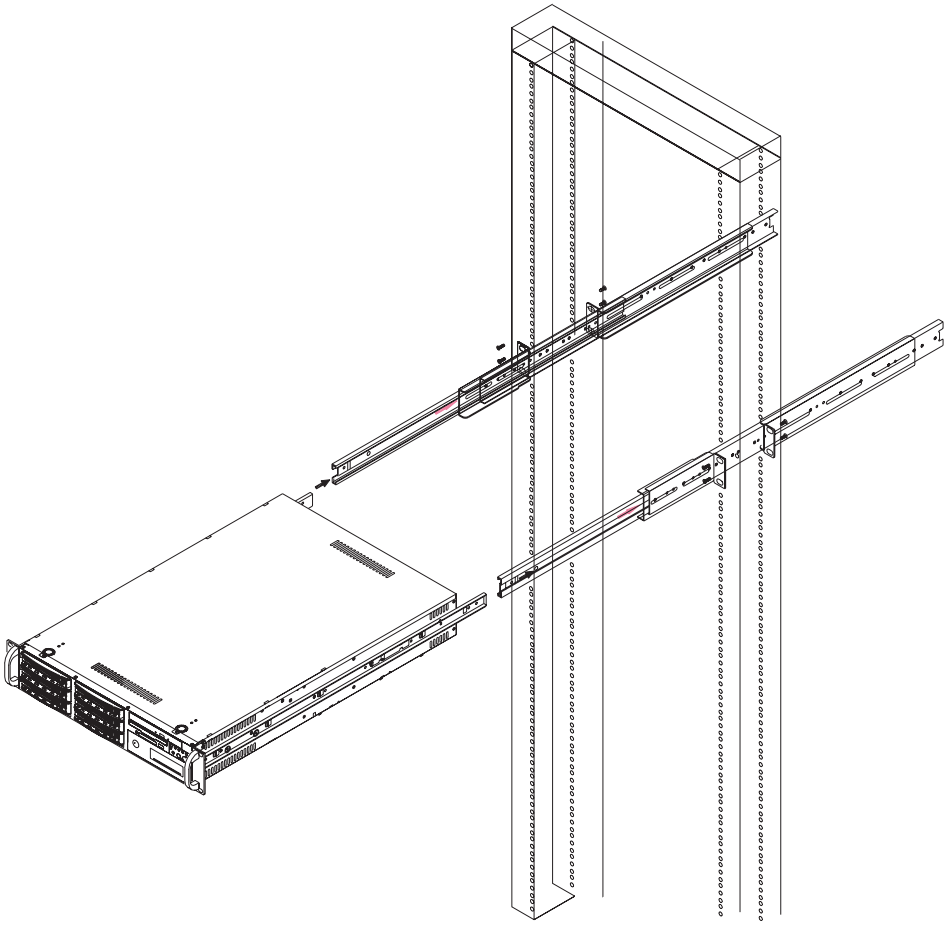
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

If you are installing the SuperServer 5025M-4+/5025M-i+ into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Motherboard Setup

After you install the 5025M-4+/5025M-i+ in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

1. Accessing the inside of the system (see Figure 2-5)

First, release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover. There is a large rectangular recess in the middle front of the top cover to help you push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

2. Check the CPUs (processors)

You should have one or two processors already installed into the system board. The processor needs a heatsink installed. See Chapter 5 for instructions on processor and heatsink installation.

3. Check the system memory

Your 5025M-4+/5025M-i+ server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

4. Installing add-on cards

If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

5. Check all cable connections and airflow

Make sure all power and data cables are properly connected and not blocking the chassis airflow. Also make sure that no cables are positioned in front of the fans. See Chapter 5 for details on cable connections.

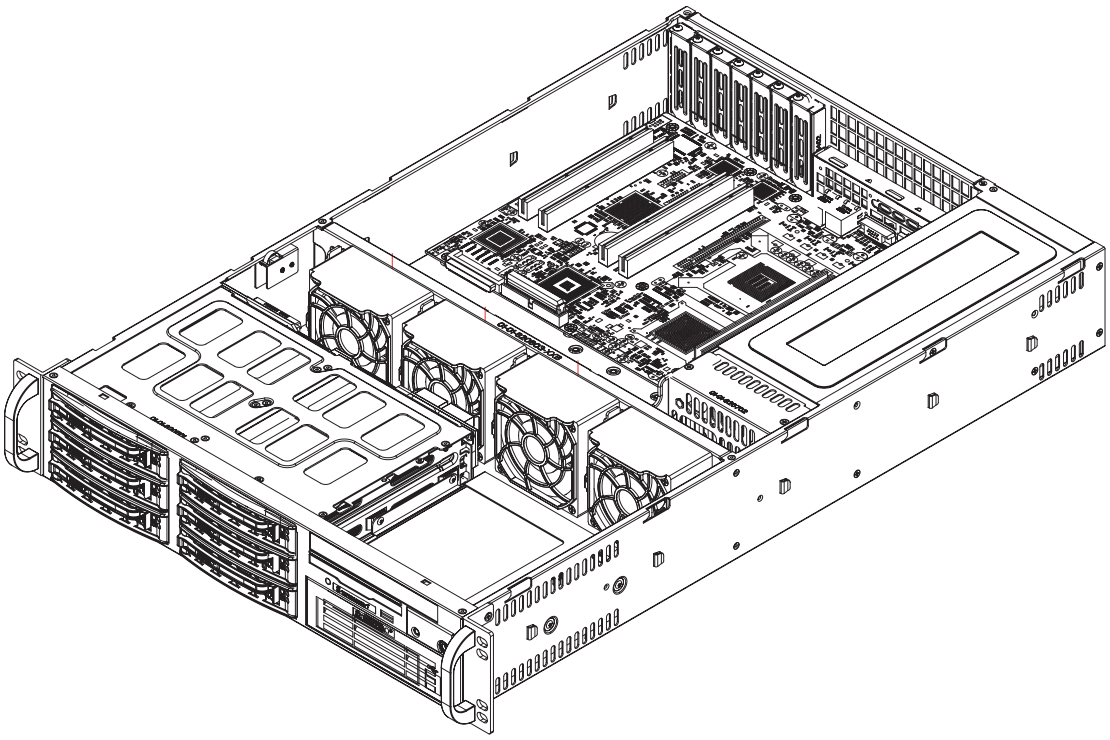


Figure 2-5. Accessing the Inside of the System

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI/IDE drives and SCA backplane (5025M-4+ only) have been properly installed and all connections have been made.

1. **Accessing the drive bays**
   All drives are accessable from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI/IDE disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. **CD-ROM and floppy disk drives**
   A slim CD-ROM and a floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. Check the SCSI/IDE disk drives

Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI/IDE drives, please refer to Chapter 6.

4. Check the airflow

Airflow is provided by four 8-cm fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans. An air shroud is included to maximize the airflow.

5. Supplying power to the system

The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3

System Interface

3-1 Overview

There are several LEDs on the control panel as well as others on the SCSI drive carriers and the motherboard to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel.

3-2 Control Panel Buttons

There are two push-button buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

- **RESET:** Use the reset button to reboot the system.

- **POWER:** This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC823S-550LP/SC823i-550LP chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

- **Overheat/Fan Fail:** When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.

NIC2

- **NIC2:** Indicates network activity on JLAN2 when flashing.

NIC1

- **NIC1:** Indicates network activity on JLAN1 when flashing.

- **HDD:** Indicates IDE channel activity. On the SuperServer 5025M-4+, this LED indicates CD-ROM drive activity when flashing.

- **Power:** Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 SCSI Drive Carrier LEDs

The 5025M-4+ has six SCSI drive bays. Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** The SAF-TE compliant backplane activates the red LED to indicate a drive failure. If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5025M-4+/5025M-i+ from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and the CD-ROM and floppy drives. When disconnecting power, you should first power down the system with the operating system and then unplug the power cord from the server's power supply.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperServer 5025M-4+/5025M-i+ clean and free of clutter.

- The SuperServer 5025M-4+/5025M-i+ weighs approximately 44/43 lbs when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

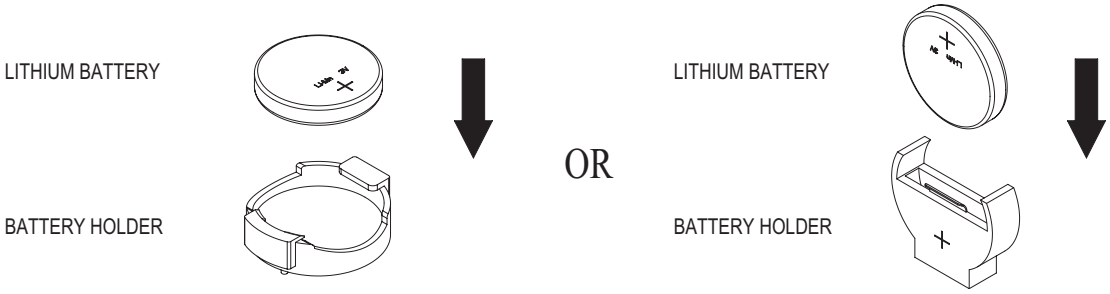
- Put the motherboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5025M-4+/5025M-i+ is operating to assure proper cooling. Out of warranty damage to the 5025M-4+/5025M-i+ system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install the PDSM4+/PDSME+ motherboard into the SC823S-550LP/SC823i-550LP chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the Motherboard

Electric-static discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the P8SC8 motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electric Static Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Motherboard Installation

This section explains the first step of physically mounting the PDSM4+/PDSME+ into the SC823S-550LP/SC823i-550LP chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

1. Accessing the inside of the system

Remove the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. Check compatibility of motherboard ports and I/O shield

The PDSM4+/PDSME+ requires a chassis big enough to support a 12" x 9.6" motherboard, such as Supermicro's SC823S-550LP/SC823i-550LP. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Mounting the motherboard onto the motherboard tray

Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system. Finish by replacing the top cover of the chassis.

5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- 5025M-4+: SCSI drive cable (JA1)
- 5025M-i+: SATA drive cables (SATA#0-3)
- Control Panel cable (JF1)
- Floppy cable (J27)
- CD-ROM drive cable (J3)

Connecting Power Cables

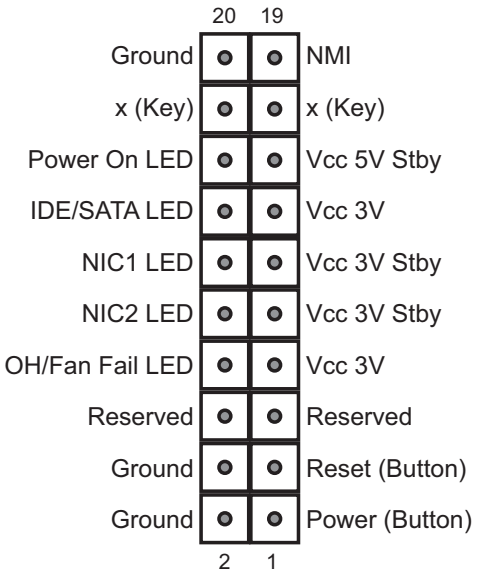
The PDSM4+/PDSME+ has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there is an 8-pin processor power connector (JPW2) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

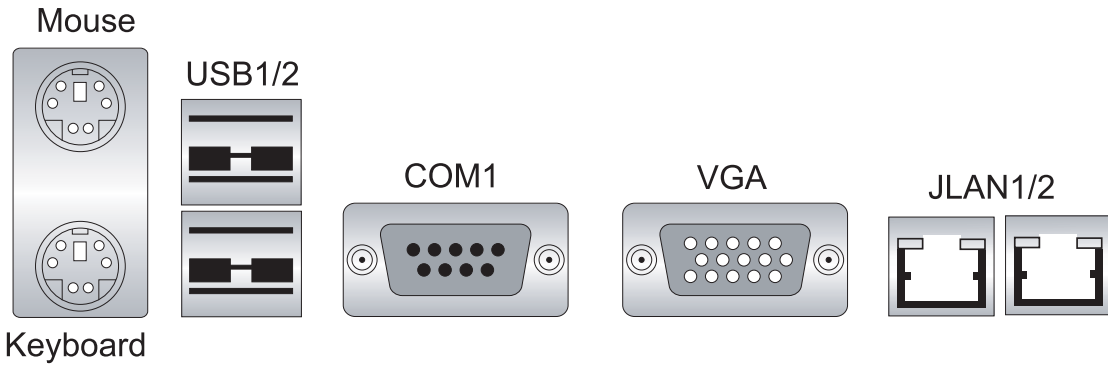
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the locations of the various I/O ports.

Figure 5-2. I/O Ports

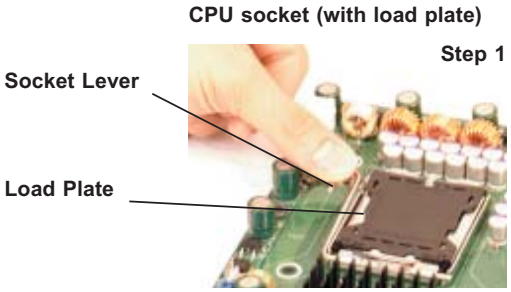


5-5 Installing the Processor and Heatsink

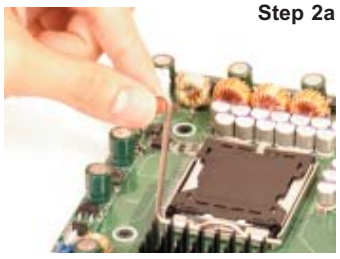
Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

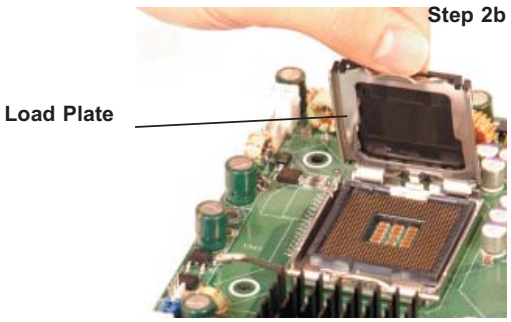
The PDSM4+/PDSME+ has a single LGA775 socket that supports Intel E6000 & E4000 sequence, PentiumD, Pentium4 or CeleronD processors. Intel's boxed CPU package contains a CPU fan and heatsink assembly. If you buy a CPU separately, make sure that you use a Intel-certified multi-directional heatsink and fan only. The Intel Pentium 4 LGA 775 heatsink and fan comes with a push-pin design and no tool is needed for installation.

1. Press the socket lever to release the load plate that covers the CPU socket from its locking position.

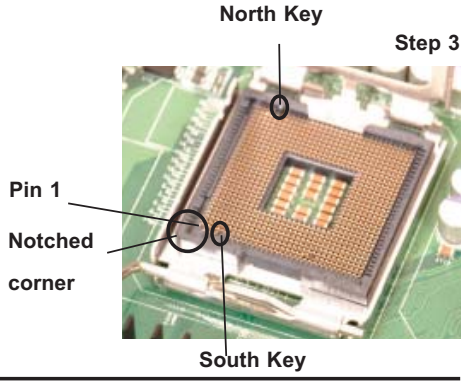


2. Carefully lift the socket lever up to open the load plate.





3. Locate Pin 1 on the CPU socket. (Pin 1 is closest to the notched corner of the housing.) Please note that a North key and a South key (notches) are located at opposite sides of the CPU housing.



4. Use your thumb and index finger to hold the CPU at the north center and south center edges of the CPU.

North Center Edge

Step 4

South Center Edge

5. Align Pin 1 of the CPU with Pin 1 of the socket. Once aligned, carefully lower the CPU straight down and into the socket. *Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface of the socket or against any pins of the socket, which may damage the CPU and/or the socket.*

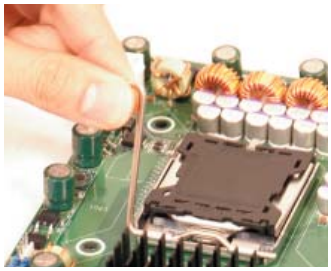
Steps 5 & 6

Socket Lever

CPU in the socket

6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

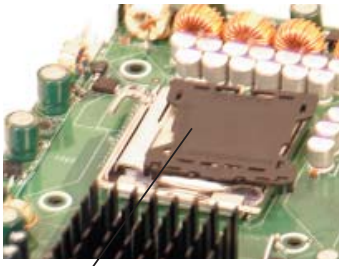
Step 7



7. Use your thumb to gently press the lever down and lock it in the hook.

8. If the CPU is properly installed into the socket, the black plastic cover will be automatically released from the load plate when the lever is pushed into the hook. Remove the cover from the motherboard.

Step 8



Plastic cap is released from the load plate when the CPU is properly installed.

Note: Keep the plastic cap. If you need to ship the motherboard, the CPU must have the plastic cap properly installed to protect the CPU pins. Shipping without the CPU plastic cap properly installed will void the warranty.

Installing the Heatsink

1. Locate the "FAN5" header on the motherboard.

2. Position the heatsink in such a way that the heatsink fan wires are closely routed to the CPU fan and do not interfere with other components.

3. Inspect the CPU fan wires to make sure that the wires are routed through the bottom of the heatsink.

4. Remove the thin layer of the protective film from the copper core of the heatsink. **Warning:** the CPU may overheat if the protective film is not removed from the heatsink.

5. Apply the proper amount of thermal grease on the CPU. (If your heatsink came with a thermal pad, please ignore this step.)

6. If necessary, rearrange the wires so that they are not pinched between the heatsink and the CPU. Also make sure there is clearance between the fan wires and the fins of the heatsink.

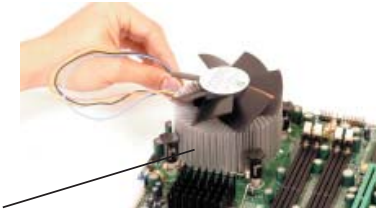
7. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push diagonal pairs of fasteners (#1 & #2 and #3 & #4) into the mounting holes until you hear a click. Orient each fastener so that the narrow end of the groove points outward.

Note: not all steps are pictured.

Step 5

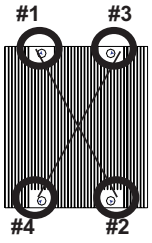
Thermal Grease

Step 6



Heatsink Fins

Step 7



Narrow end of the groove points outward

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory support

The PDSM4+/PDSME+ supports dual-channel, unbuffered ECC or non-ECC DDR2-667/533/400 SDRAM. Both interleaved and non-interleaved memory configurations are supported, so you may populate any number of DIMM slots. Populating both slots of a bank (DIMM#1A and DIMM#1B and/or DIMM#2A and DIMM#2B) with DIMMs of the same size, type and speed will result in dual-channel, interleaved memory, which is faster than single-channel, non-interleaved memory. Note than when ECC memory is used, it may take 25-40 seconds for the VGA to display.

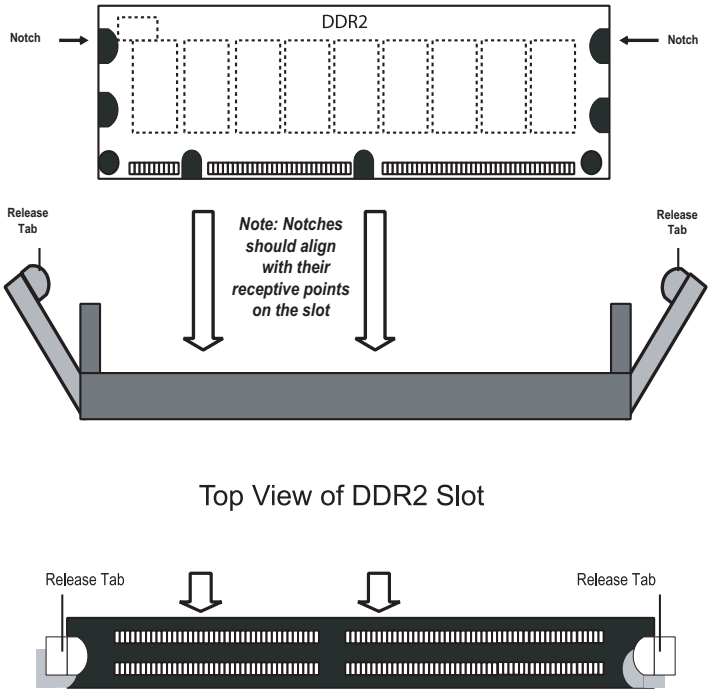
Notes:

1. Due to a chipset limitation, 8GB of memory can only be supported by the following operating systems:
   32-Bit: Windows 2000 Advanced Server, Windows Server 2003 Enterprise Edition
   64-Bit: Windows Server 2003 Standard x64 Edition, Windows XP Professional x64 Edition, Windows Server 2003 Enterprise x64 Edition
2. You may install 2GB DIMMs in each slot; however, only DDR2-533 2GB DIMMs are available for this configuration.
3. Some older versions of DDR2-667 may not match Intel's ODT (On-Die-Temperature) requirement and will be automatically down-graded to run at 533 MHz. If this occurs, contact your memory vendor to check the ODT value.

Installing memory modules

Insert each memory module vertically, paying attention to the notches along the bottom of the module to prevent inserting it incorrectly. Gently press down on the DIMM module until it snaps into place in the slot (see Figure 5-3).

Figure 5-3. DIMM Installation



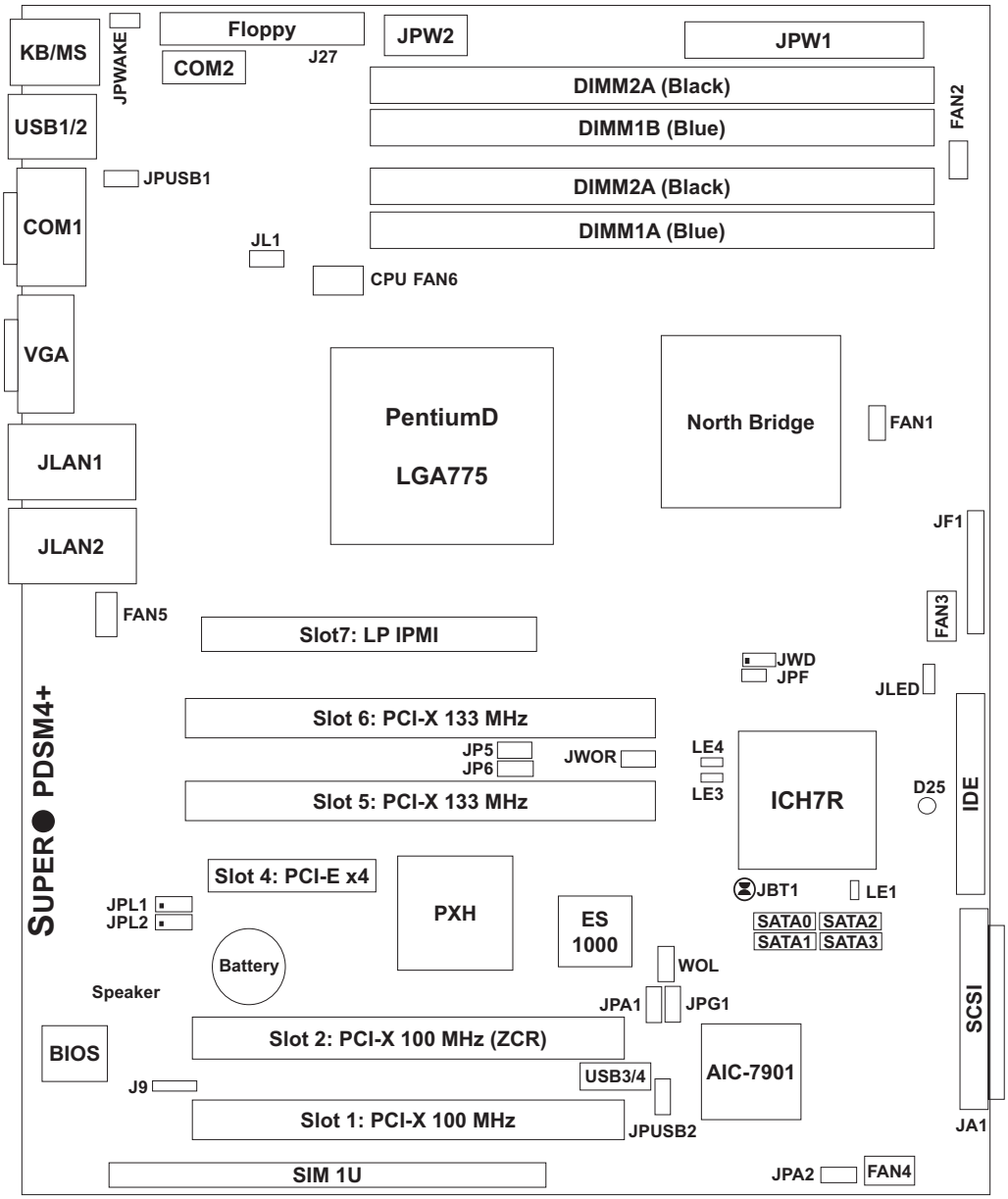
To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.
To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

5-7 Adding PCI Add-On Cards

The SC823S-550LP/SC823i-550LP chassis can accommodate three standard size (full height, full length) PCI expansion slots on the PDSM4+/PDSME+. To install an add-on card, begin by removing the PCI slot shield for the slot you wish to populate. Fully seat the card into the card slot on the motherboard, pushing down with your thumbs evenly on both sides of the card. Finish by using a screw to secure the top of the card shield to the backpanel of the chassis. The PCI slot shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused PCI-E/PCI-X slot.

5-8 Motherboard Details

Figure 5-4. PDSM4+/PDSME+ Layout
(not drawn to scale)



Notes: Jumpers not indicated are for test purposes only. The SCSI connectors, jumpers and components are not included on the PDSME+.

PDSM4+/PDSME+ Quick Reference

Jumpers	Description	Default Setting
J9	Int./Ext. Speaker	Pins 3-4 (Internal Spkr)
JBT1	CMOS Clear	See Section 5-10
JP5/JP6	SMB to PCI Slots	Both Open (Disabled)
JPA1*	SCSI Channel Enable	Pins 1-2 (Enabled)
JPA2*	SCSI Channel Termination	Open (Enabled)
JPF	Power Force-On	Open (Disabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1/JPL2	Gb LAN1/2 Ports En/Disable	Pins 1-2 (Enabled)
JPUSB1	USB1/2 Ports Wake-Up	Pins 2-3 (Disabled)
JPUSB2	USB2/3 Headers Wake-Up	Pins 2-3 (Disabled)
JPWAKE	Keyboard/Mouse Wake-up	Pins 2-3 (Disabled)
JWD	Watch Dog Enable	Pins 1-2 (Reset)

Connectors	Description
COM1/COM2	COM1 Port and COM2 Header
Fans 1-5	CPU and System Fan Headers
J3	IDE Connector
J27	Floppy Disk Connector
JA1*	SCSI Connector
JF1	Front Panel Control Header
JL1	Chassis Intrusion Header
JLAN1/JLAN2	Ethernet RJ45 (Gb LAN) Ports
JLED	PWR LED
JPW1	ATX 24-Pin Power Connector
JPW2	12V 8-pin Processor Power Connector
JWOR	Wake-On-Ring Header
KB/MS	PS/2 Keyboard/Mouse Ports
SIM 1U	IPMI Slot
SATA 0-3	Serial ATA Headers
Speaker	Onboard Speaker (Buzzer)
USB1/2	USB (Universal Serial Bus) Ports 1/2
USB3/4	USB3/4 Headers
VGA	VGA Connector
WOL	Wake-On-LAN Header

Onboard Indicator	Description
LE 1	Onboard +5V Standby PWR warning LED Indicator
LE3/LE4	BIOS POST Code Indicators (See Appendix A)

*PDSM4+ only

5-9 Connector Definitions

Main ATX Power Supply Connector

The primary power supply connector (JPW1) meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. You must also connect the 8-pin (JPW2) processor power connector to your power supply (see below).

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connector

JPW2 must also be connected to the power supply to provide power for the processor. See the table on the right for pin definitions.

+12V 8-pin Power Pin Definitions (JPW2)

Pins	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

PW_ON Connector

The PW_ON connector is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	Ground

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

IDE/SATA LED

The IDE/SATA LED connection is located on pins 13 and 14 of JF1. This LED is used to display all IDE and SATA activity. See the table on the right for pin definitions.

IDE/SATA LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	5V Stby
16	Control

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Fan Headers

There are five fan headers on the motherboard, which are designated CPU_FAN1 through FAN5. Connect the fan on your CPU heatsink to the CPU_FAN1 header. See the table on the right for pin definitions.

Fan Header Pin Definitions (FAN1-5)

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J28. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (KB/MS)

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Wake-On-LAN

The Wake-On-LAN header is designated WOL on the motherboard. See the table on the right for pin definitions. You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.

Wake-On-LAN Pin Definitions (WOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)	
Pin#	Definition
1	Ground (Black)
2	Wake-up

JLAN1/2 (Ethernet Ports)

Two Ethernet ports (designated JLAN1 and JLAN2) are located beside the COM port on the I/O backplane. These ports accept RJ45 type cables.

Serial Ports

Two serial ports are included on the motherboard. COM1 is a backpanel port and COM2 is a header located near the floppy drive connector. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Power LED

The Power LED header is located on JLED. This header provides LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JLED)

Pin#	Definition
1	Anode
2	Key
3	Cathode

Universal Serial Bus (USB)

There two Universal Serial Bus ports located on the I/O panel and two USB headers located on the motherboard. The headers can be used to provide front side USB access (cables not included). See the table on the right for pin definitions.

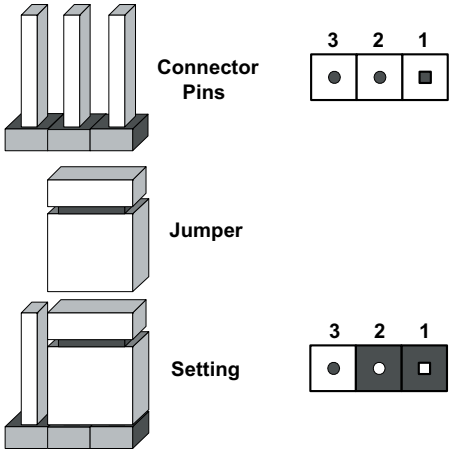
Universal Serial Bus Pin Definitions (USB)

USB1/2		USB3/4	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.



Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS. To clear CMOS,

1) First power down the system and unplug the power cord(s)
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver
3) Remove the screwdriver (or shorting device)
4) Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

Speaker Connector

To use the internal (onboard) speaker, place a jumper on pins 3-4 of J9. If you wish to use an external speaker, connect the speaker header to all four pins of J9.

Speaker Jumper Pin Definitions (J9)	
Setting	Definition
Jump pins 3-4	Internal Speaker
Connect to 1-4	External Speaker

Watch Dog Enable/Disable

JWD enables the Watch Dog function, a system monitor that takes action when a software application freezes the system. Jumping pins 1-2 will have WD reboot the system if a program freezes. Jumping pins 2-3 will generate a non-maskable interrupt for the program that has frozen. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Watch Dog Jumper Settings (JWD)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

Note: when Watch Dog is enabled, the user must write their own application software to disable the Watch Dog Timer.

JLAN1/2 Enable/Disable

Change the setting of jumper JPL1 or JPL2 to enable or disable the JLAN1 or JLAN2 ports, respectively. See the table on the right for jumper settings. The default setting is enabled.

JLAN1/2 Enable/Disable Jumper Settings (JPL1/JPL2)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SMBus to PCI

Jumpers JP5 and JP6 allow you to connect PCI/PCI-X slots to the System Management Bus. The default setting is "Open" to disable the connection. See the table on the right for jumper settings.

SMBus to PCI Enable/Disable Jumper Settings (JP5/JP6)

Jumper Setting	Definition
Closed	Enabled
Open	Disabled

System Power Force On

Jumper JPF allows you to enable or disable the Force-Power-On function. If enabled, system power will always stay on. If disabled (the normal setting), the user needs to press the power button to power on the system.

System Power Force On Jumper Settings (JPF)	
Jumper Setting	Definition
Closed	Force On
Open	Disabled

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SCSI Controller Enable/ Disable (5025M-4+ only)

Jumper JPA1 is used to enable or disable the LSI SCSI controller. The default setting is on pins 1-2 to enable SCSI. See the table on the right for jumper settings.

SCSI Enable/Disable Jumper Settings (JPA1)	
Both Jumpers	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SCSI Termination Enable/ Disable (5025M-4+ only)

Jumper JPA2 is used to enable or disable termination for the SCSI connector. The default setting is open to enable termination. See the table on the right for jumper settings.

Note: In order for the SCSI drives to function properly, please do not change the default setting (enabled) set by the manufacturer.)

SCSI Term. Enable/Disable Jumper Settings (JPA2)	
Jumper Setting	Definition
Open	Enabled
Closed	Disabled

USB Wake-Up

JPUSB1 and JPUSB2 are used to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to a USB port. The JPUSB jumpers are used together with the USB Wake-Up function in the BIOS. Enable both the jumpers and the BIOS setting to allow the system to "wake-up via a USB device". See the table on the right for jumper settings and jumper connections. JPUSB1 is for USB1/2 and JPUSB2 is for the USB3/4 headers.

USB Wake-Up Jumper Settings (JPUSB1/2)

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Note: The default jumper setting is "Disabled". However, when the "USB Wake-Up" function is enabled in BIOS and the desired USB ports are enabled via the JPUSB jumper, please be sure to remove all USB devices from the USB ports whose USB jumpers are set to "Disabled" before the system goes into standby mode.

Keyboard Wake-Up

The JPWAKE jumper is used to allow the system to be woken up by depressing a key on the keyboard from an S1 or S3 state in Windows OS. See the table on the right for jumper settings. Your power supply must meet ATX specification 2.01 or higher and supply 720 mA of standby power to use this feature.

Keyboard Wake-Up Jumper Settings (JPWAKE)

Jumper Setting	Definition
Pins 1-2	Disabled
Pins 2-3	Enabled

5-11 Onboard Indicators

LAN LEDs

The Ethernet port has two LEDs. The yellow (right) LED indicates activity while the left LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the left (activity speed) LED.

JLAN Left LED (Connection Speed Indicator)

LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

5-12 Floppy, IDE, SCSI and SATA Drive Connections

Use the following information to connect the IDE hard disk drive cables.

- A red mark on a wire typically designates the location of pin 1.

- The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Floppy Connector

The floppy connector is located behind the mouse/keyboard ports. See the table at right for pin definitions.

Floppy Drive Connector Pin Definitions (J27)

Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

IDE Connector

There are no jumpers to configure the onboard IDE interface. See the table below for pin definitions.

IDE Drive Connectors Pin Definitions (J3)

Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground

SATA Connectors

There are no jumpers to configure the onboard SATA connectors. See the table on the right for pin definitions.

SATA Connector Pin Definitions (SATA0-3)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

SCSI Connector (5025M-4+ only)

Refer to the table at right for pin definitions for the Ultra320 SCSI connector located at JA1.

Ultra320 SCSI Drive Connector Pin Definitions (JA1)

Pin#	Definition	Pin #	Definition
1	+DB (12)	35	-DB (12)
2	+DB (13)	36	-DB (13)
3	+DB (14)	37	-DB (14)
4	+DB (15)	38	-DB (15)
5	+DB (P1)	39	-DB (P1)
6	+DB (0)	40	-DB (0)
7	+DB (1)	41	-DB (1)
8	+DB (2)	42	-DB (2)
9	+DB (3)	43	-DB (3)
10	+DB (4)	44	-DB (4)
11	+DB (5)	45	-DB (5)
12	+DB (6)	46	-DB (6)
13	+DB (7)	47	-DB (7)
14	+DB (P)	48	-DB (P)
15	Ground	49	Ground
16	DIFFSENS	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	+ATN	55	-ATN
22	Ground	56	Ground
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB (8)	65	-DB (8)
32	+DB (9)	66	-DB (9)
33	+DB (10)	67	-DB (10)
34	+DB (11)	68	-DB (11)

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC823S-550LP/SC823i-550LP chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required

The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electricstatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

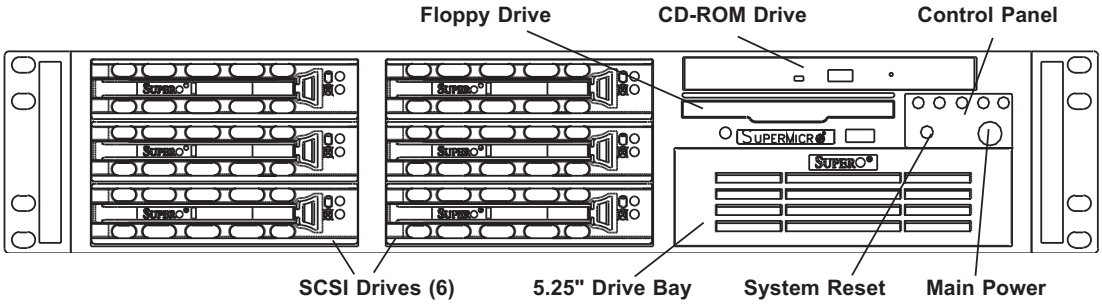
- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

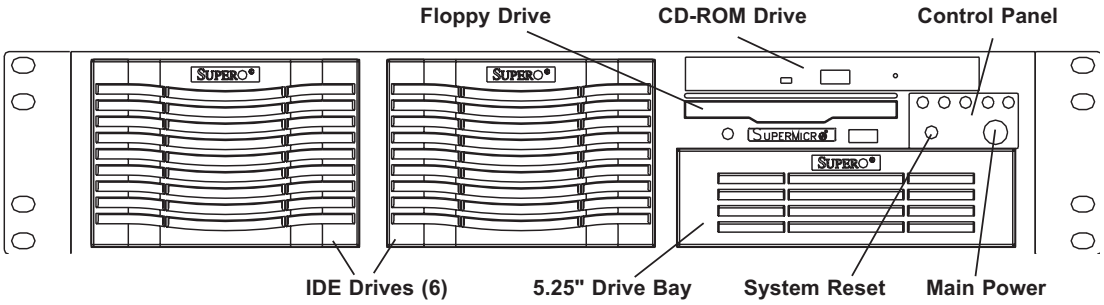
The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Chassis: Front and Rear Views

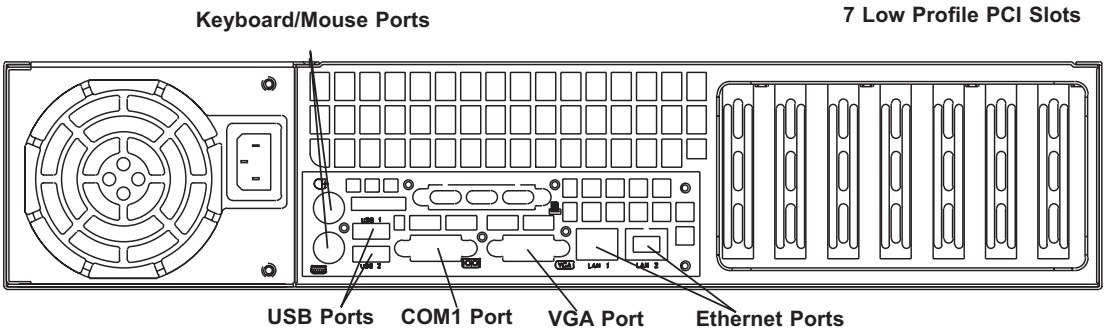
5025M-4+



5025M-i+



Rear view (both chassis)



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the motherboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF2 can be found in the "Chapter 5: Advanced Motherboard Installation."

6-3 System Fans

Four 8-cm fans provide all the cooling needed for the SuperServer 5025M-4+/5025M-i+. It is very important that the chassis top cover is properly installed and making a good seal for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace the failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the four fans has failed.

Replacing System Cooling Fans

1. Removing a fan

Remove the chassis cover. Press the tab on the top of the fan housing of the failed fan and remove the entire housing unit. The system power need not be shut down since the fans are all hot-pluggable.

2. Installing a new fan

Replace the failed fan with an identical 8-cm, 12 volt fan (available from Supermicro, p/n FAN-0070). Position the new fan at its proper place in the chassis by fitting the fan with its housing onto the fan mounts in the chassis. A "click" can be heard if the fan (in its housing) is properly installed. If the system is already powered on, the fan will activate immediately upon being connected to its header on the motherboard.

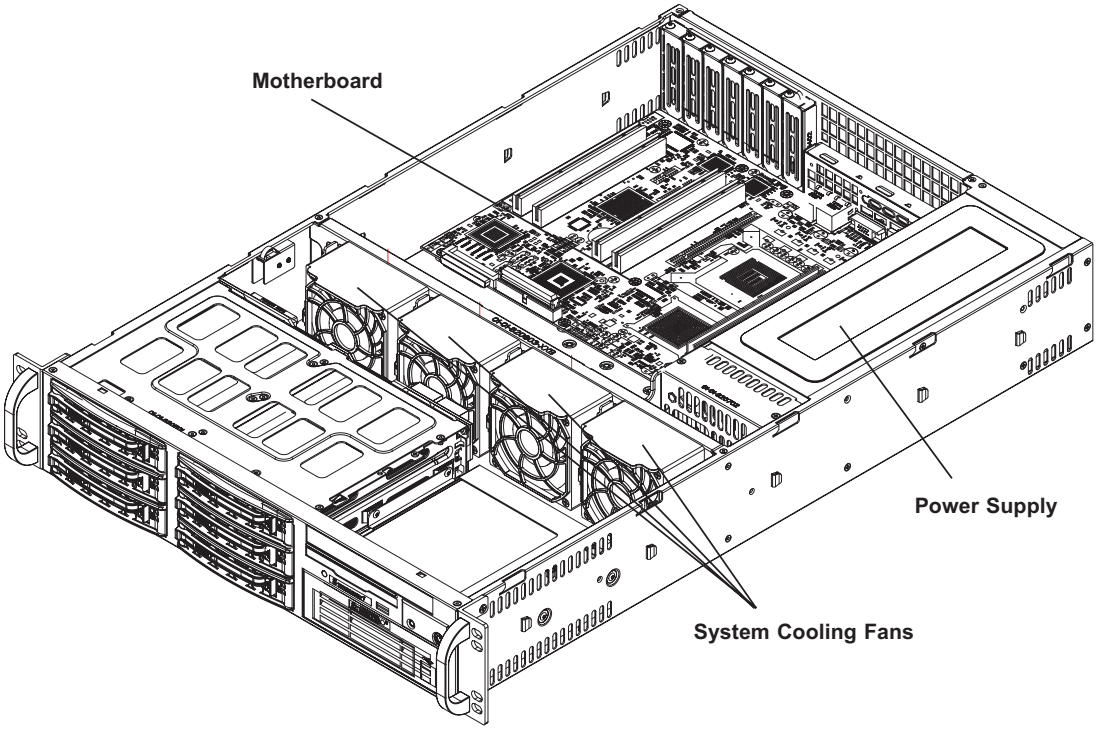


Figure 6-2. System Cooling Fans

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SCSI Drives: You do not need to access the inside of the chassis to replace or swap SCSI drives. Proceed to the next step for instructions.

Note: You must use standard 1" high, 80-pin SCA SCSI drives in the SuperServer 5025M-4+.

CD-ROM/Floppy Disk Drive: For installing/removing the CD-ROM or floppy disk drive, you will need to gain access to the inside of the server by removing the top cover of the chassis. Proceed to the "CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

5.25" Drive Bay: For installing/removing a component in the 5.25" drive bay, proceed to the "5.25" Drive Bay Installation" section later in this chapter for instructions.

SCSI Drive Installation (5025M-4+ only)

1. Mounting a SCSI drive in a drive carrier

The SCSI drives are mounted in drive carriers to simplify their installation and removal from the chassis. Since these carriers also help promote proper airflow for the SCSI drive bays, even empty carriers without SCSI drives installed must remain in the chassis. To add a new SCSI drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

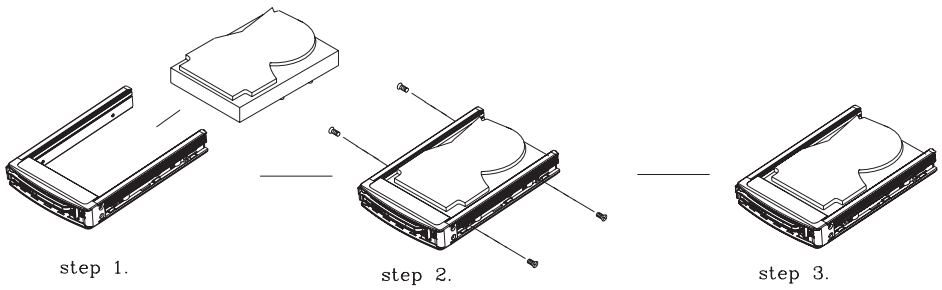


Figure 6-3. Mounting a SCSI Drive in a Carrier

Use caution when working around the SCSI backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

<u>Important:</u> Regardless of how many SCSI/IDE hard drives are installed, all drive carriers must remain in the drive bays for proper airflow.

2. Installing/removing hot-swap SCSI drives

The SCSI drive bays are located in the front of the chassis and are hot-swap units, meaning that they can be installed and removed while the system is running. To remove a SCSI drive, first push the colored release button located beside the drive's LEDs, then swing the handle fully out and use it to pull the SCSI drive carrier straight out (see Figure 6-4).

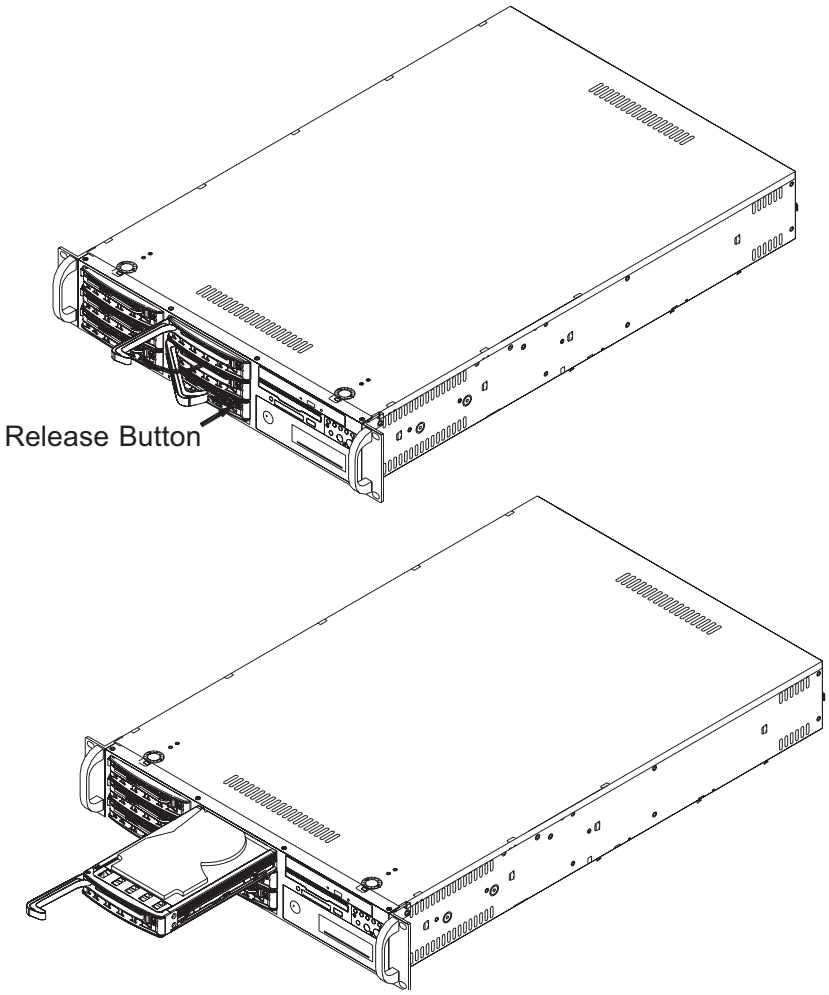


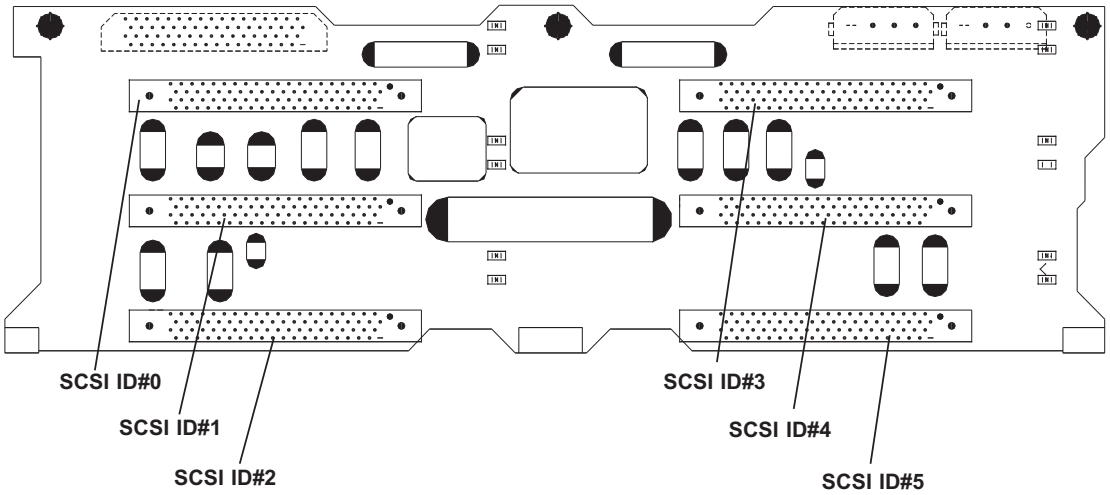
Figure 6-4. Removing SCSI Drives

Important: All of the SCSI drive carriers must remain in the drive bay to maintain proper cooling airflow.

SCA Backplane

The SCSI drives plug into a SAF-TE compliant SCA backplane (CSE-SCA-822S) that provides power, SCSI ID and bus termination. A RAID controller can be used with the SCA backplane to provide data security. The operating system you use must have RAID support to enable the hot-swap capability of the SCSI drive. The SCA SCSI backplane is already preconfigured; there are no jumpers or switches.

Figure 6-5. SCSI SCA Backplane



SCSI ID#6 is used for the SAF-TE Controller

IDE Drive Installation (5025M-i+ only)

1. Mounting an IDE drive in the drive carrier

Like SCSI drives, IDE drives are also mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow. For this reason, even empty carriers without IDE drives installed must remain in the chassis. To add a new IDE drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with the four screws.

2. Installing/Removing IDE drives

The two IDE drive bays located in the front of the chassis will each accommodate up to three IDE drives. IDE drives are not hot-swappable, meaning system power must be turned off before installing and/or removing them. To install or remove a drive, first power down the system and then remove the top cover of the chassis. Unscrew the retention screw at the top center of the drive, then push the drive carrier out from the back until you can grasp and pull it out through the front of the chassis. Reverse this procedure when installing a drive carrier, making sure you screw in the retention screw. Replace the top cover when finished.

Installing a Component in the 5.25" Drive Bay

1. Mounting the component in the drive carrier

A component such as an IDE hard drive or an additional SCSI drive that can fit into a standard IDE drive bay can be mounted in the 5.25" drive bay. The component should also be mounted in a drive carrier to simplify its installation and removal from the chassis. These carriers also help promote proper airflow. For this reason, even empty carriers without a component installed must remain in the chassis. To add a component such as those noted above, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with the four screws.

2. Installing/removing a 5.25" drive bay component

A single 5.25" IDE drive bay is located in the front of the chassis, making it easily accessible for installation and removal. This component is not hot-swappable, meaning system power must be turned off before installing and/or removing them. To remove the drive carrier, first power down the system and then remove the top cover of the chassis. Unscrew the retention screw at the top center of the drive, then push the drive carrier out from the back until you can grasp and pull it out through the front of the chassis. Attach the component to the carrier if installing. Then reverse the drive carrier removal procedure to install the drive, making sure you screw in the retention screw. Replace the top cover when finished.

CD-ROM and Floppy Drive Installation

The top cover of the chassis must be opened to gain full access to the CD-ROM and floppy drive bays. The 5025M-4+/5025M-i+ accomodates only slim CD-ROM drives. Side mounting brakets are typically needed to mount a CD-ROM drive in the 5025M-4+/5025M-i+ server.

First, release the retention screws that secure the server unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click"). Next, depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. You must power down the system before installing or removing floppy or IDE components.

Drives mount on rails and should "click" into place to be correctly and fully installed in their bays.

- The floppy disk drive cable has seven twisted wires.
- A color mark on a cable typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

6-5 Power Supply

The SuperServer 5025M-4+/5025M-i+ has a single 550 watt power supply. This power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V to 220V input voltage.

Power Supply Failure

If the power supply fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro. See contact information in Chapter 1.

Removing/Replacing the Power Supply

Replace the failed power supply module with the same model (p/n PWS-0047), which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. Removing the power supply

First shut down the system, then unplug the power cord. Remove the chassis cover by pressing the two release buttons on the top of the chassis (near the front) then push the chassis top rearward about one inch and lift it off. To remove the failed power supply, remove the screws at the back that secure it to the chassis and pull the unit straight out with the rounded handle.

2. Installing a new power supply

Replace the failed hot-swap unit with another power supply unit (p/n PWS-0047). Push the new power supply unit into the power bay until you hear a *click*. Secure the power supply with the screws you removed previously and finish by plugging in the AC power cord.

Chapter 7

BIOS

7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the PDSM4+/PDSME+. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS Logic, enabling it to retain system parameters. Each time the computer is powered on the computer is configured with the values stored in the CMOS Logic by the system BIOS, which gains control at boot up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. (See below.)

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 7-3, detailed descriptions are given for each parameter setting in the Setup utility.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

7-2 Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (see next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

7-3 Main BIOS Setup

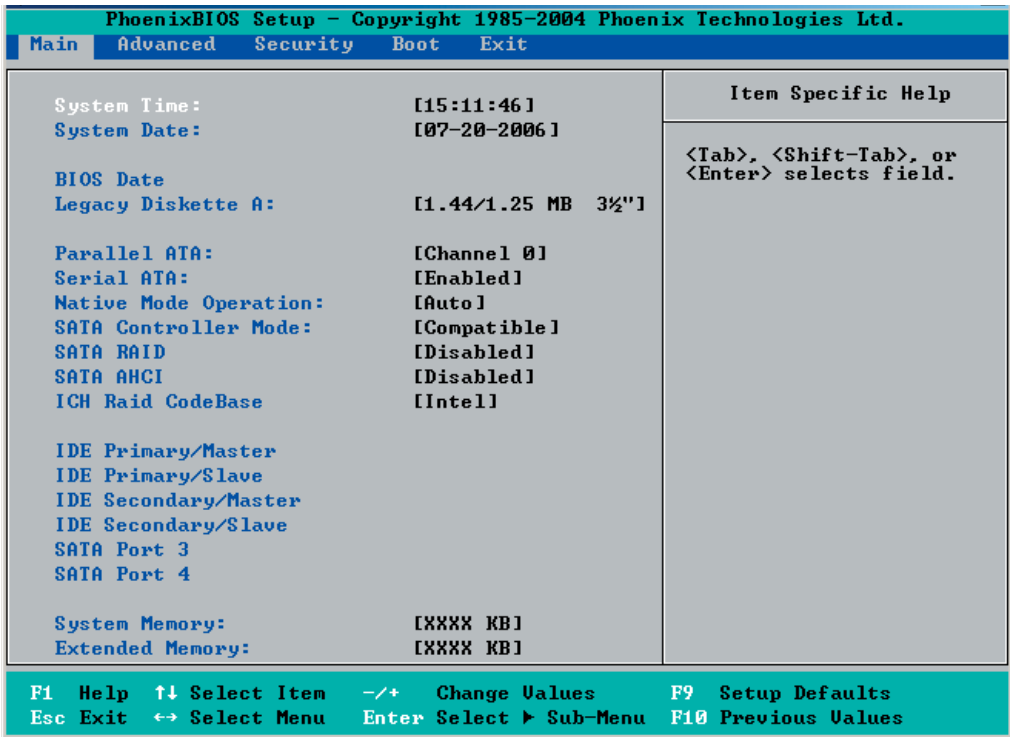
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶ icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
System Time: [15:11:46]
System Date: [07-20-2006]
BIOS Date
Legacy Diskette A: [1.44/1.25 MB 3½"]
Parallel ATA: [Channel 0]
Serial ATA: [Enabled]
Native Mode Operation: [Auto]
SATA Controller Mode: [Compatible]
SATA RAID [Disabled]
SATA AHCI [Disabled]
ICH Raid CodeBase [Intel]
IDE Primary/Master
IDE Primary/Slave
IDE Secondary/Master
IDE Secondary/Slave
SATA Port 3
SATA Port 4
System Memory: [XXXX KB]
Extended Memory: [XXXX KB]
Item Specific Help
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

BIOS Date

This field displays the date when this version of BIOS was built.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

Parallel ATA

This setting allows the user to enable or disable the function of Parallel ATA. The options are Disabled, **Channel 0**, channel 1, and Both.

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Native Mode Operation

Select the native mode for ATA. The options are: Parallel ATA, Serial ATA, Both, and **Auto**.

SATA Controller Mode

Select **Compatible** to allow the SATA and PATA drives to be automatically-detected and be placed in the Legacy Mode by the BIOS. Select Enhanced to allow the SATA and PATA drives to be to be automatically-detected and be placed in the Native IDE Mode. (***Note: The Enhanced mode is supported by the Windows 2000 OS or a later version.)**

When the SATA Controller Mode is set to "Enhanced", the following items will display:

Serial ATA (SATA) RAID Enable

Select Enable to enable Serial ATA RAID Functions. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: "ICH RAID Code Base" will be available for you to select either Intel or Adaptec Host RAID firmware to be activated. If this item is set to **Disabled**, the item-SATA AHCI Enable will be available.) The options are Enabled and **Disabled**.

SATA AHCI

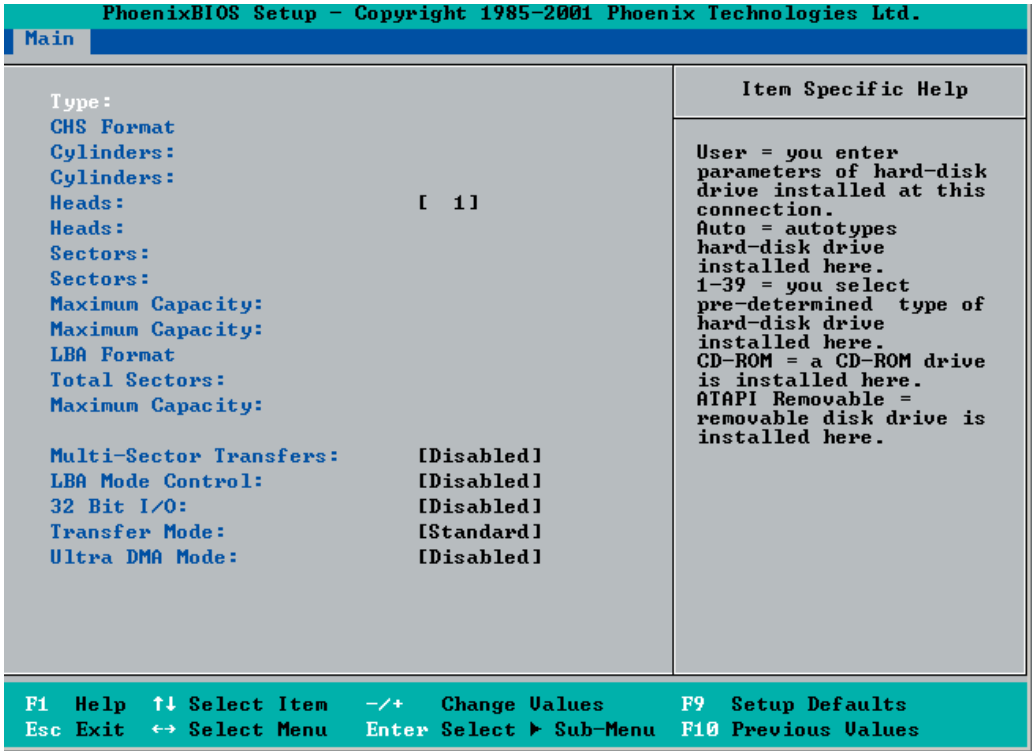
Select Enable to enable the function of Serial ATA Advanced Host Interface. (*Take caution when using this function. This feature is for advanced programmers only. The options are Enabled and **Disabled**.)

ICH RAID Code Base

Select Intel to enable Intel's SATA RAID firmware. Select Adaptec to use Adaptec's HostRAID firmware. The options are **Intel** and Adaptec**.**

▶IDE Primary Master/Slave, IDE Secondary Master/Slave, SATA Port3 and SATA Port4

These settings allow the user to set the parameters of IDE Primary Master/Slave, IDE Secondary Master/Slave, SATA Port3/SATA Port4 slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main
Type:
CHS Format
Cylinders:
Cylinders:
Heads: [1]
Heads:
Sectors:
Sectors:
Maximum Capacity:
Maximum Capacity:
LBA Format
Total Sectors:
Maximum Capacity:
Multi-Sector Transfers: [Disabled]
LBA Mode Control: [Disabled]
32 Bit I/O: [Disabled]
Transfer Mode: [Standard]
Ultra DMA Mode: [Disabled]
Item Specific Help
User = you enter parameters of hard-disk drive installed at this connection.
Auto = autotypes hard-disk drive installed here.
1-39 = you select pre-determined type of hard-disk drive installed here.
CD-ROM = a CD-ROM drive is installed here.
ATAPI Removable = removable disk drive is installed here.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Type

Selects the type of IDE hard drive. The options are **Auto**, (which allows the BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CDROM and ATAPI Removable. The option "User" will allow the user to enter the parameters of the HDD installed at this connection. The option "Auto" will allow the BIOS to automatically configure the parameters of the HDD installed at the connection. Choose the option 1-39 to select a predetermined HDD type. Select CDROM if a CDROM drive is installed. Select ATAPI if a removable disk drive is installed.

CHS Format

The following items will be displayed by the BIOS:

TYPE: This item displays the type of IDE or SATA Device.

Cylinders: This item indicates the status of Cylinders.

Headers: This item indicates the number of headers.

Sectors: This item displays the number of sectors.

Maximum Capacity: This item displays the maximum storage capacity of the system.

LBA Format

The following items will be displayed by the BIOS:

Total Sectors: This item displays the number of total sectors available in the LBA Format.

Maximum Capacity: This item displays the maximum capacity in the LBA Format.

Multi-Sector Transfers

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are **Disabled**, 4 Sectors, 8 Sectors, and 16 Sectors.

LBA Mode Control

This item determines whether the Phoenix BIOS will access the IDE Primary Master Device via the LBA mode. The options are Enabled and **Disabled.**

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This option allows the user to set the transfer mode. The options are **Standard**, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

This option allows the user to select Ultra DMA Mode. The options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and Mode 5.

System Memory

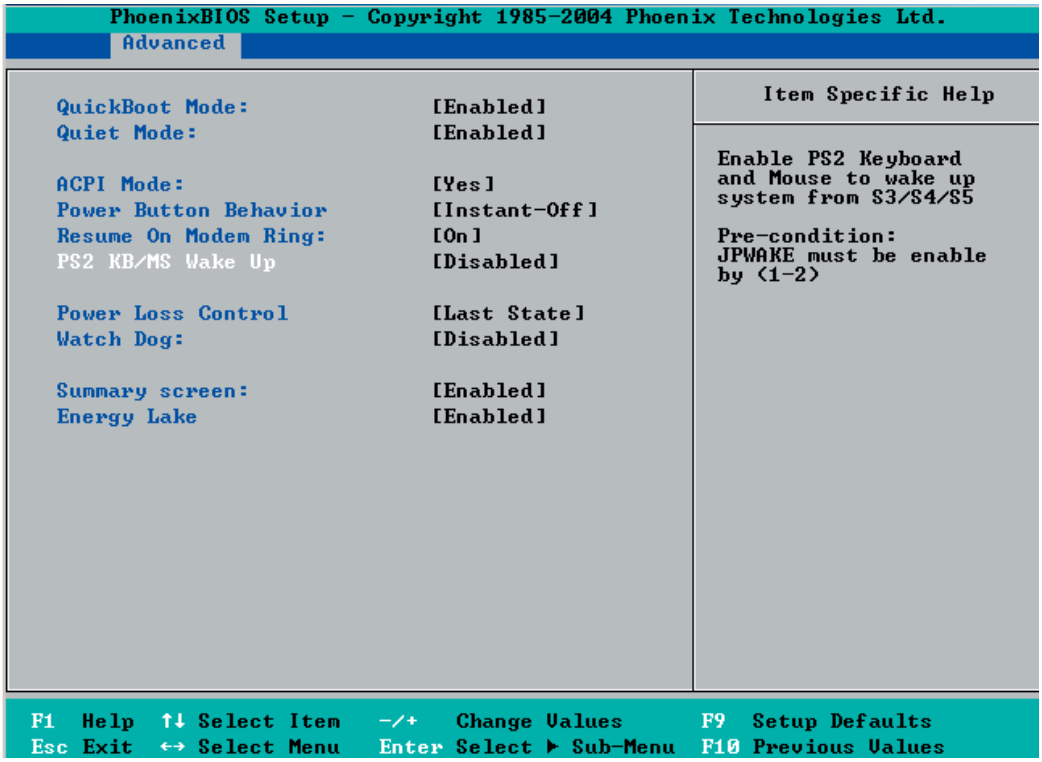
This display informs you how much system memory is recognized as being present in the system.

Extended Memory

This display informs you how much extended memory is recognized as being present in the system.

7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Advanced
QuickBoot Mode: [Enabled]
Quiet Mode: [Enabled]
ACPI Mode: [Yes]
Power Button Behavior [Instant-Off]
Resume On Modem Ring: [On]
PS2 KB/MS Wake Up [Disabled]
Power Loss Control [Last State]
Watch Dog: [Disabled]
Summary screen: [Enabled]
Energy Lake [Enabled]
Item Specific Help
Enable PS2 Keyboard and Mouse to wake up system from S3/S4/S5
Pre-condition: JPWAKE must be enable by (1-2)
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

▶Boot Features

Access the submenu to make changes to the following settings.

QuickBoot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Quiet Boot

This setting allows you to **Enable** or Disable the graphic logo screen during boot-up.

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system. The options are **Yes** and No.

Power Button Behavior

If set to **Instant-Off**, the system will power off immediately as soon as the user hits the power button. If set to 4-sec., the system will power off when the user presses the power button for 4 seconds or longer. The options are instant-off and 4-sec override.

Resume On Modem Ring

Select On to “wake your system up” when an incoming call is received by your modem. The options are **On** and Off.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On, and **Last State**.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

▶Memory Cache

Memory Cache

Set to enabled to set the state of Cache Memory. The options are **Enabled** and Disabled.

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable this function, and this area will be reserved for BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS write (cache) its data into this reserved memory area. Select "**Write Protect**" to enable the function and this area will be reserved for Video BIOS ROM access only. Select "Uncached" to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into L1, L2 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations . Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 512-640K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into L1, L2, L3 cache inside the CPU to speed up CPU operations. Select "Uncached" to disable this function. Select "Write Through" to allow data to be cached into the buffer and written into the system memory at the same time. Select "Write Protect" to prevent data from being written into the base memory area of Block 0-512K. Select "Write Back" to allow CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Discrete MTRR Allocation

If enabled, MTRRs (-Memory Type Range Registers) are configured as distinct, separate units and cannot be overlapped. If enabled, the user can achieve better graphic effects when using a Linux graphic driver that requires the write-combining configuration with 4GB or more memory. The options are Enabled and **Disabled**.

▶PCI Configuration

Access the submenu to make changes to the following settings for PCI devices.

Onboard GLAN1/Onboard GLAN2 (Gigabit- LAN) OPROM Configure

Enabling this option provides the capability to boot from GLAN. The options are **Disabled** and Enabled.

Onboard SCSI OPROM Configure

Enabling this option provides the capitally to boot from SCSI HDD. The options are Disabled and **Enabled**.

Reset Configuration Data

If set to Yes, this setting clears the Extended System Configuration Data- (ESCD) area. The options are Yes and **No**.

Frequency for PPCI-X#1-#2/SCSI

This option allows the user to change the bus frequency for the devices installed in the slot indicated. The options are **Auto**, PCI 33 MHz, PCI 66 MHz, PCI-X 66 MHz, PCI-X 100 MHz, and PCI-X 133 MHz.

▶Slot1 PCI-X 100 MHz ZCR, Slot2 PCI-X 100MHz, Slot3 PCI-Exp x4, Slot4 PCI-X 133MHz, Slot5 PCI-X 133MHz, and Slot6 PCI-Exp x8

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are **Enabled** and Disabled.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novell and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or Other (for Unix, Novelle NetWare and other operating systems).

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

*__Warning__: Take Caution when changing the Advanced settings. Incorrect values entered may cause system malfunction. Also, a very high DRAM frequency or incorrect DRAM timing may cause system instability. When this occurs, revert to the default setting.

Clock Spectrum Feature

If Enabled, the BIOS will monitor the level of Electromagnetic Interference caused by the components and will attempt to decrease the interference whenever needed. The options are Enabled and **Disabled**.

ECC Conditions

This setting specifies the ECC Error conditions that will be treated as "ECC Error Events" by the system. The options are None, Single Bit, **Multiple Bit,** and Both. (*Note: This item is available when it is supported by the memory.)

ECC Error Handler

This setting allows you to select the type of interrupt to be activated as a result of an ECC error. The options are None, NMI (Non-Maskable Interrupt), **SMI** (System Management Interrupt) and SCI (System Control Interrupt.) (*Note: This item is available when it is supported by the memory.)

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are Disabled, PCI and **LPC**.

USB Function

Select Enabled to enable the function of USB devices specified. The settings are **Enabled** and Disabled.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio (*Available when supported by the CPU.)

The feature allows the user to set the internal frequency multiplier for the CPU. The options are: **Default,** x12, x13, x14, x15, x16, x17 and x18.

Hyperthreading (*Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Machine Checking (*Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are Disabled and **Enabled**.

L3 Cache(*Available when supported by the CPU.)

Set to Enabled to enable the function of L3 Cache to optimize system and CPU performance. The options are Disabled and **Enabled**.

Thermal Management 2 (*Available when supported by the CPU.)

Set to **Enabled** to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold. Set to Disabled to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

Adjacent Cache Line Prefetch (*Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

C1 Enhanced Mode (*Available when supported by the CPU.)

Set to Enabled to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are Enabled and **Disabled**. (***Note:** please refer to Intel's web site for detailed information.)

Intel <R> Virtualization Technology (*Available when supported by the CPU.)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. (*Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect.) Please refer to Intel's web site for detailed information.

No Execute Mode Memory Protection (*Available when supported by the CPU and the OS.)

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

(*Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit.) The options are Disabled and **Enabled**. (Note: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.)

Processor Power Management (*Available when supported by the CPU.)

This feature allows the user to determine the processor power management mode. The options are **Disabled** and C States Only. If set to Disabled, C States and GV1/GV3 are disabled. If set to C States only, the processor power will be controlled through CPU power states in the APCI setting.

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for KBC. The options are 6MHz, 8MHz, **12MHz,** and 16MHz.

Serial Port A

This setting allows you to assign control of serial port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

This setting allows you to select the base I/O address for serial port A. The options are **3F8**, 2F8, 3E8, and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for serial port A. The options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

This setting allows you to set the type of device that will be connected to serial port B. The options are **Normal** and IR (for an infrared device).

Base I/O Address

This setting allows you to select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for serial port B. The options are **IRQ3** and IRQ4.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS and OS controlled).

Base I/O Address

This setting allows you to select the base I/O address for the Floppy port. The options are **Primary** and Secondary.

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

ECC Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify to redirect the console to Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to select the BAUD rate for console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

This item allows you to choose from the available options to select the console type for console redirection. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, and VT-UTF8.

Flow Control

This item allows you to choose from the available options to select the flow control for console redirection. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to choose select the console connection: either **Direct** or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. The options are On and **Off**.

▶Hardware Monitor Logic

CPU Temperature Threshold

This option allows the user to set a CPU temperature threshold that will activate the alarm system when the CPU temperature reaches this pre-set temperature threshold. The options are 70°C, 75°C, **80°C** and 85°C.

Highlight this and hit <Enter> to see monitor data for the following items:

CPU Temperature

PECI Agent

System Temperature

Fan1-Fan6 Speeds: If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of the fans indicated in this item.

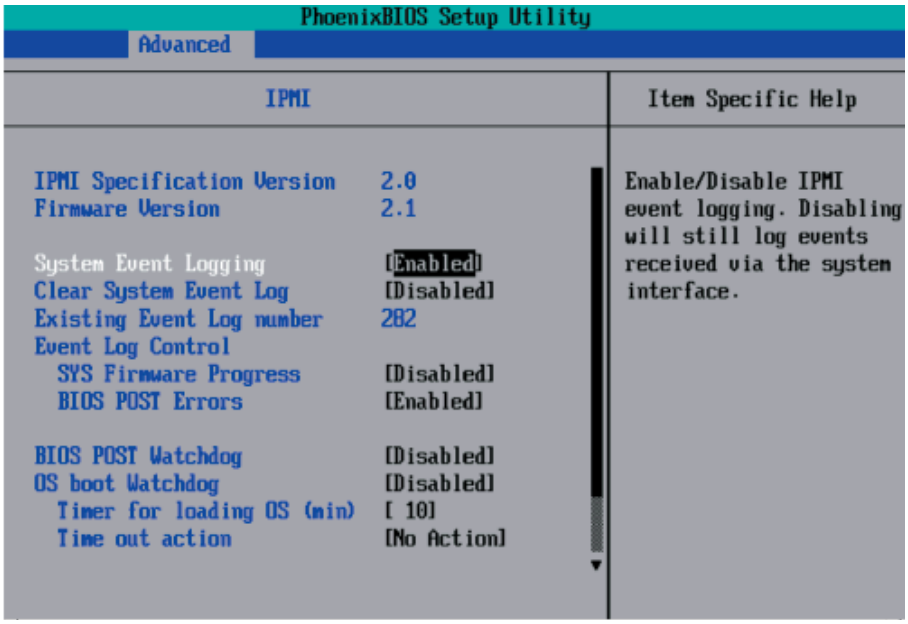
Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vise versa. If the option is set to "3-pin fan", the fan speed is controlled by voltage. If the option is set to "4-pin", the fan speed will be controlled by Pulse Width Modulation (PWM). Select "3-pin" if your chassis came with 3-pin fan headers. Select "4-pin" if your chassis came with 4-pin fan headers. Select "Workstation" if your system is used as a Workstation. Select "Server" if your system is used as a Server. Select "Disable" to disable the fan speed control function to allow the onboard fans to run at the full speed (12V) at all the time. The Options are: **1. Disable**, 2. 3-pin (Server), 3. 3-pin (Workstation), 4. 4-pin (Server) and 5. 4-pin (Workstation).

Voltage Monitoring

The following items will be monitored and displayed:
Vcore A
Vcc 1.5V
-12V
Vcc 1.8V
+3.3V
+12V
5Vsb
5VDD
Vfsb
Vbat

▶IPMI (The option is available only when an IPMI card is installed in the system.)


PhoenixBIOS Setup Utility
Advanced
IPMI
Item Specific Help
IPMI Specification Version 2.0
Firmware Version 2.1
System Event Logging [Enabled]
Clear System Event Log [Disabled]
Existing Event Log number 282
Event Log Control
SYS Firmware Progress [Disabled]
BIOS POST Errors [Enabled]
BIOS POST Watchdog [Disabled]
OS boot Watchdog [Disabled]
Timer for loading OS (min) [10]
Time out action [No Action]
Enable/Disable IPMI event logging. Disabling will still log events received via the system interface.

IPMI Specification Version: This item displays the current IPMI Version.

Firmware Version: This item displays the current Firmware Version.

System Event Logging

Select Enabled to enable IPMI Event Logging. When this function is set to Disabled, the system will continue to log events received via system interface. The options are **Enabled** and Disabled.

Clear System Event Logging

Enabling this function to force the BIOS to clear the system event logs during the next cold boot. The options are Enabled and **Disabled**.

Existing Event Log Number

This item displays the number of the existing event log.

Event Log Control

System Firmware Progress

Enabling this function to log POST progress. The options are Enabled and **Disabled**.

BIOS POST Errors

Enabling this function to log POST errors. The options are Enabled and **Disabled**.

BIOS POST Watch Dog

Set to Enabled to enable POST Watch Dog. The options are Enabled and **Disabled**.

OS Boot Watch Dog

Set to Enabled to enable OS Boot Watch Dog. The options are Enabled and **Disabled**.

Timer for Loading OS (Minutes)

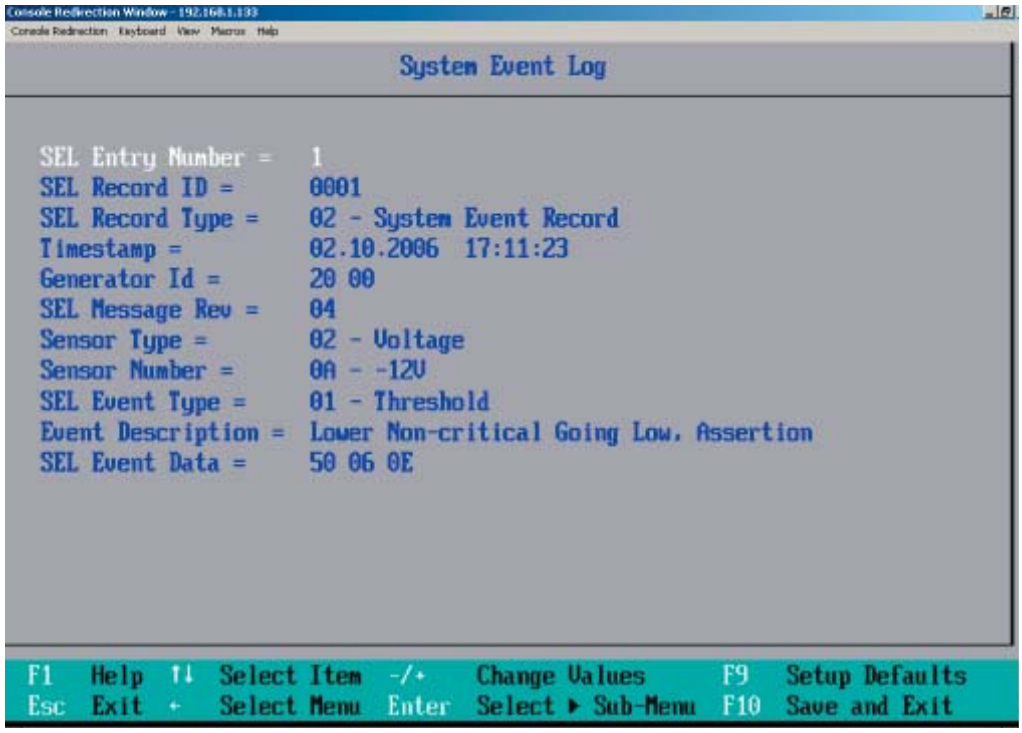
This feature allows the user to set the time value (in minutes) for the previous item: OS Boot Watch Dog by keying-in a desired number in the blank. The default setting is 10 (minutes.) (Please ignore this option when OS Boot Watch Dog is set to "Disabled".)

Time Out Option

This feature allows the user to determine what action to take in an event of a system boot failure. The options are **No Action, Reset, Power Off and Power Cycles.**

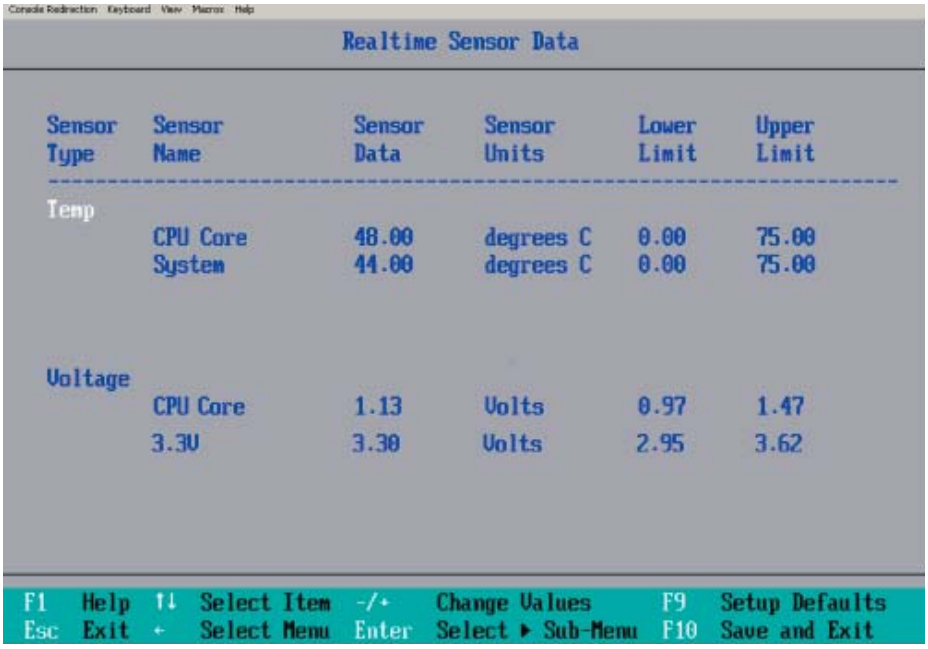
▶System Event Log/System Event Log (List Mode)

These options display the System Event (SEL) Log and System Event (SEL) Log in List Mode. Items include: SEL (System Event Log) Entry Number, SEL Record ID, SEL Record Type, Time Stamp, Generator ID, SEL Message Revision, Sensor Type, Sensor Number, SEL Event Type, Event Description, and SEL Event Data.


Console Redirection Window - 192.168.1.133
Console Redirection Keyboard View Macros Help
System Event Log
SEL Entry Number = 1
SEL Record ID = 0001
SEL Record Type = 02 - System Event Record
Timestamp = 02.10.2006 17:11:23
Generator Id = 20 00
SEL Message Rev = 04
Sensor Type = 02 - Voltage
Sensor Number = 0A - -12V
SEL Event Type = 01 - Threshold
Event Description = Lower Non-critical Going Low, Assertion
SEL Event Data = 50 06 0E
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

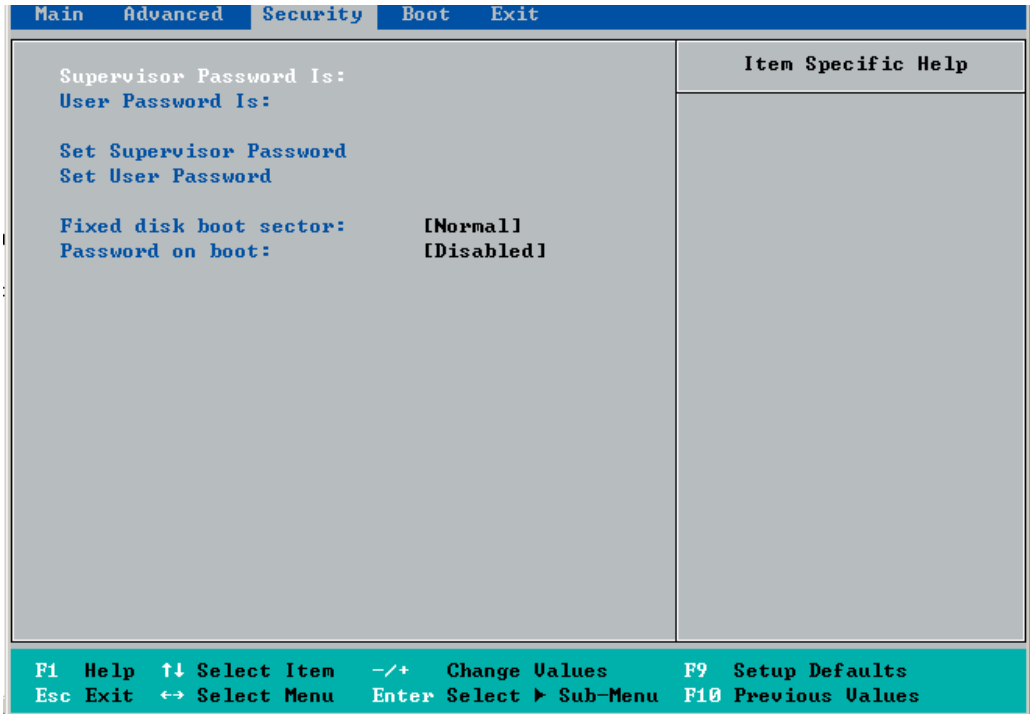
▶Realtime Sensor Data

This feature display information from motherboard sensors, such as temperatures, fan speeds and voltages of various components.


Realtime Sensor Data
Sensor Type
Sensor Name
Sensor Data
Sensor Units
Lower Limit
Upper Limit
Temp
CPU Core 48.00 degrees C 0.00 75.00
System 44.00 degrees C 0.00 75.00
Voltage
CPU Core 1.13 Volts 0.97 1.47
3.3V 3.30 Volts 2.95 3.62
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

7-5 Security

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.


Main Advanced Security Boot Exit
Item Specific Help
Supervisor Password Is:
User Password Is:
Set Supervisor Password
Set User Password
Fixed disk boot sector: [Normal]
Password on boot: [Disabled]
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

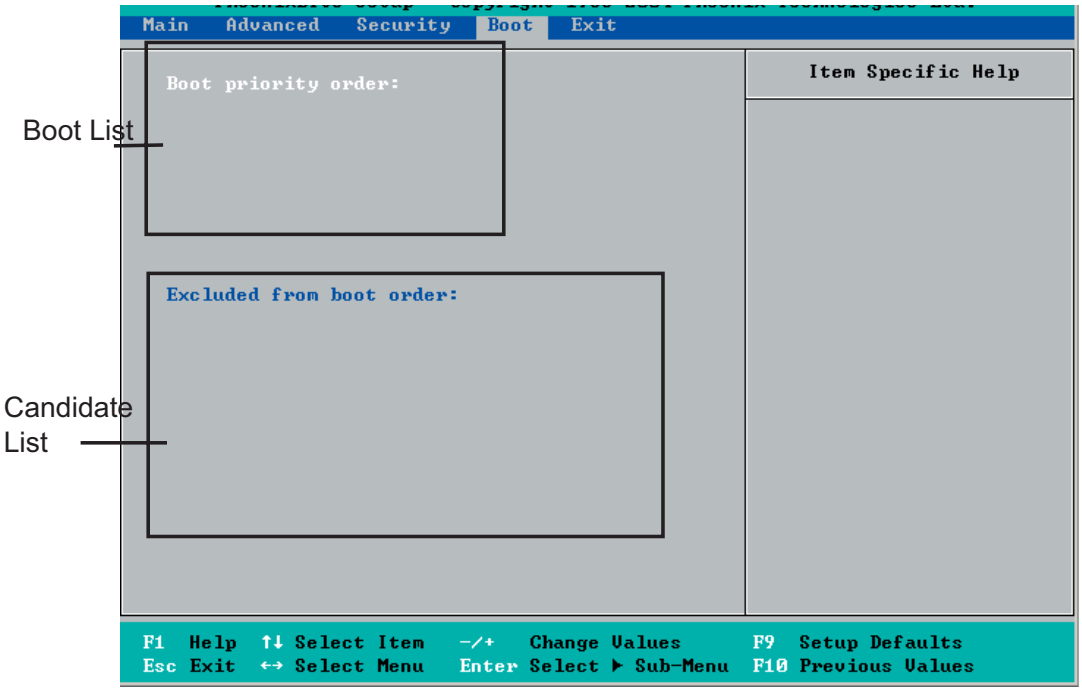
When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. The options are **Enabled** (password required) and Disabled (password not required).

7-6 Boot

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

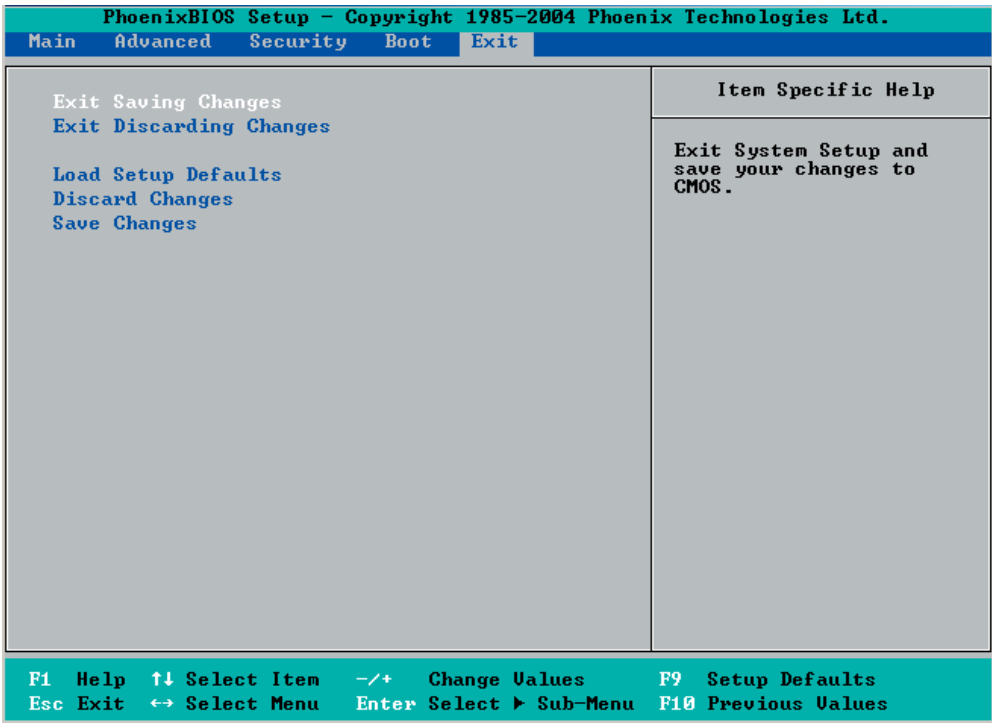

Main Advanced Security Boot Exit
Boot priority order:
Item Specific Help
Boot List
Excluded from boot order:
Candidate List
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Boot Priority Order/Excluded from Boot Orders

The devices included in the boot list section (above) are bootable devices listed in the sequence of boot order as specified. The boot functions for the devices included in the candidate list (above) are currently disabled. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of an USB device, either fixed or removable. You can select one item from the boot list and hit the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Subsequently, you can select an item from the candidate list and hit the <x> key to remove it from the candidate list and put it in the boot list. This item will then become a bootable device. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Exit System Setup and save your changes to CMOS.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Notes

Appendix A

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key
Stuck key on keyboard.

Keyboard error
Keyboard not working.

Keyboard Controller Failed
Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch
Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error
The timer test failed. Requires repair of system board.

Real time clock error
Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used
Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous
Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup
Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:
PS/2 mouse identified.

Run the I2O Configuration Utility
One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed
System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*
Displays the address ***nnnn*** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed
Video BIOS successfully copied to shadow RAM.

Notes

Appendix B

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error
1 repetitive long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

POST Code	Description
01h	IPMI Initialization
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Reset PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line ***xxxx****
2Eh	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot (optional)
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board (optional)
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt “Press <ESC> to enter SETUP”
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring (optional)
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs (optional)
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs and shadow if successful. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase <ESC> prompt
AAh	Scan for <ESC> key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST (optional)
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS and PPM Structures
B9h	Prepare Boot
BAh	Initialize SMBIOS
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error flags
C6h	Console redirection init.
C7h	Unhook INT 10h if console redirection enabled
C8h	Force check (optional)
C9h	Extended ROM checksum (optional)
CDh	Reclaim console redirection vector

POST Code	Description
D2h	Unknown interrupt
D4h	Check Intel Branding string
D8h	Alert Standard Format initialization
D9h	Late init for IPMI
DEh	Log error if micro-code not updated properly

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) indicating the address line or bits that failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C

Software Installation

After all the hardware has been installed, you must first configure Intel's ICH7R SATA RAID* before you install the Windows Operating System and other software drivers.

If you do not wish to configure onboard SATA RAID functions, please go directly to Section C-4 on page C-16 for Operating System & Other Software Installation.

C-1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH7R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. (The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard.) Note that the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to Intel ICH7R Serial RAID

Located in the South Bridge of the E7230 Mukilteo chipset, the I/O Controller Hub (ICH7R) provides the I/O subsystem with access to the rest of the system. It supports a 2-channel UltraATA/100 Bus Master IDE controller (PATA) and four Serial ATA (SATA) ports. The ICH7R supports the following PATA and SATA device configurations: Legacy mode and Native mode.

RAID Configurations

The following types of RAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH7R, allows the user to create RAID 0 and RAID1 set by using only two identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generate a virtual RAID0 and RAID1sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (Native Mode)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA Control Mode" and press the <Enter> key to select "Enhanced"

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled."
6. Scroll down to "Exit". Select "Save and Exit" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

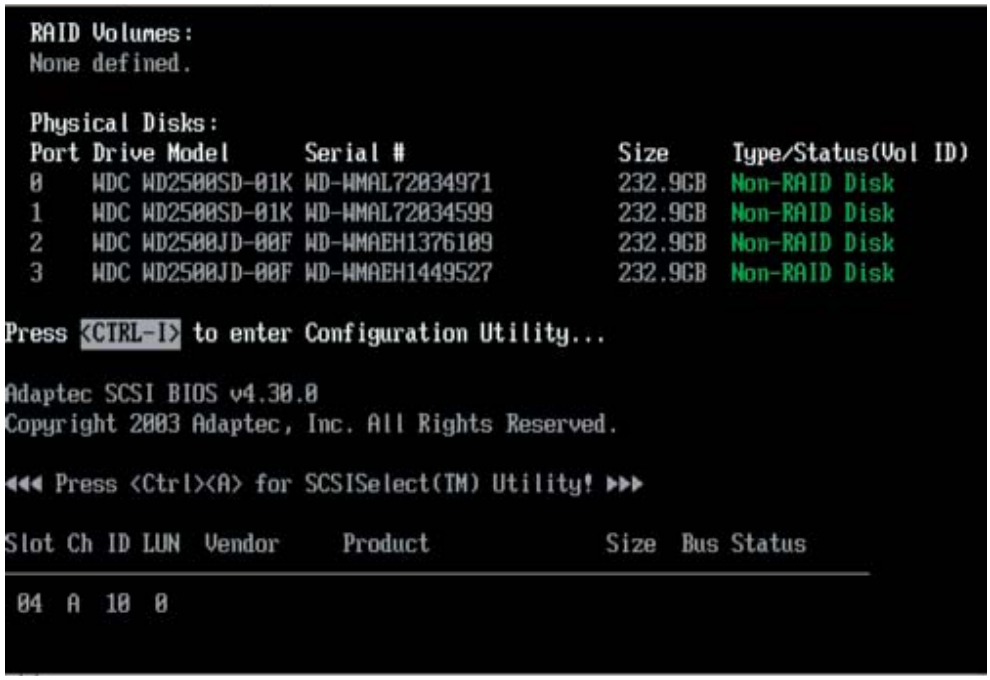
7. Once you've exited the BIOS Utility, the system will re-boot.

8. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <I> for* Intel *RAID Configuration Utility*.

Using the Intel ICH7R SATA RAID Utility Program

1. Creating, Deleting and Resetting RAID Volumes:

a. After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test.

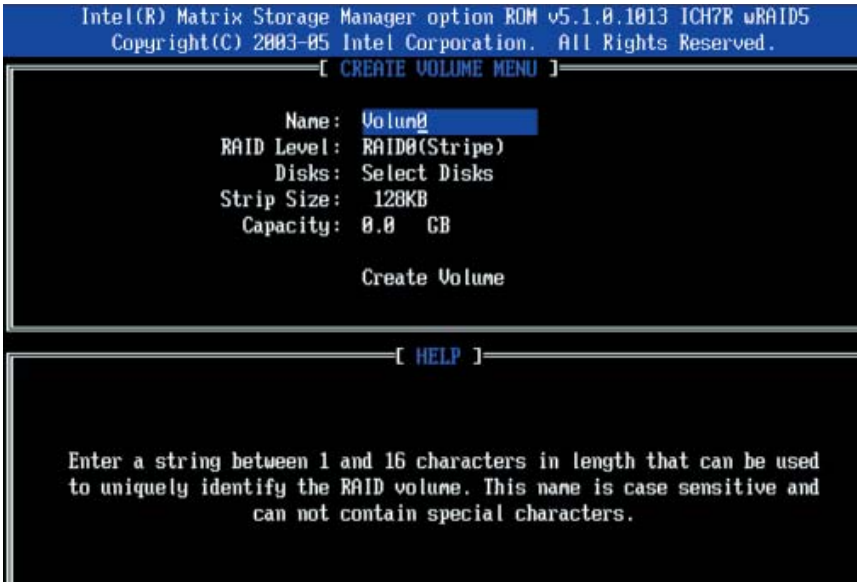

RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
0 WDC WD2500SD-01K WD-WMAL72034971 232.9GB Non-RAID Disk
1 WDC WD2500SD-01K WD-WMAL72034599 232.9GB Non-RAID Disk
2 WDC WD2500JD-00F WD-WMAEH1376109 232.9GB Non-RAID Disk
3 WDC WD2500JD-00F WD-WMAEH1449527 232.9GB Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility...
Adaptec SCSI BIOS v4.30.0
Copyright 2003 Adaptec, Inc. All Rights Reserved.
<<< Press <Ctrl><A> for SCSISelect(TM) Utility! >>>
Slot Ch ID LUN Vendor Product Size Bus Status
04 A 10 0

b. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to have the main menu of the SATA RAID Utility appear:

Note: All graphics and screen shots shown in the manual are for reference only. The screen shots shown in the manual do not imply Supernicro's endorsement or non-endorsement on any 3rd party's product. Your screens may or many not look exactly the same as the graphics shown in this manual.)

Creating a RAID 0 Volume:

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volun0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the **RAID 0** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 0 (Stripe)** and hit <Enter>.

d. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:

[SELECT DISKS]
Port Drive Model Serial # Size Status
0 WDC WD2500SD-01KCB0 WD-WMAL72834971 232.9GB Non-RAID Disk
1 WDC WD2500SD-01KCB0 WD-WMAL72834599 232.9GB Non-RAID Disk
2 WDC WD2500JD-00FYB0 WD-WMAEH1376109 232.9GB Non-RAID Disk
3 WDC WD2500JD-00FYB0 WD-WMAEH1449527 232.9GB Non-RAID Disk
Select 2 to 4 disks to use in creating the volume.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete

e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

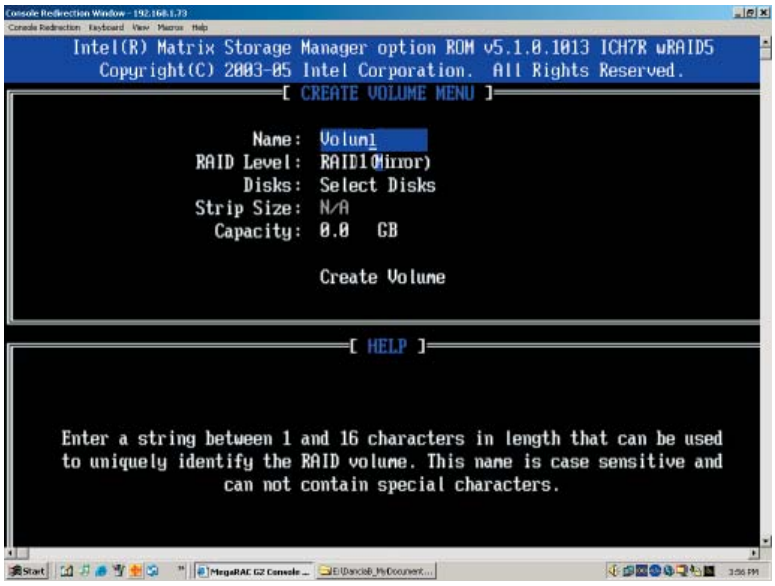
f. Use the <Up Arrow>, <Down Arrow> keys to selet the stripe size, ranged from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.The default stripe size is 128 KB.)

g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume:

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volun1
RAID Level: RAID1(Mirror)
Disks: Select Disks
Strip Size: N/A
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the **RAID 1** set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select **RAID 1 (Mirror)** and hit <Enter>.

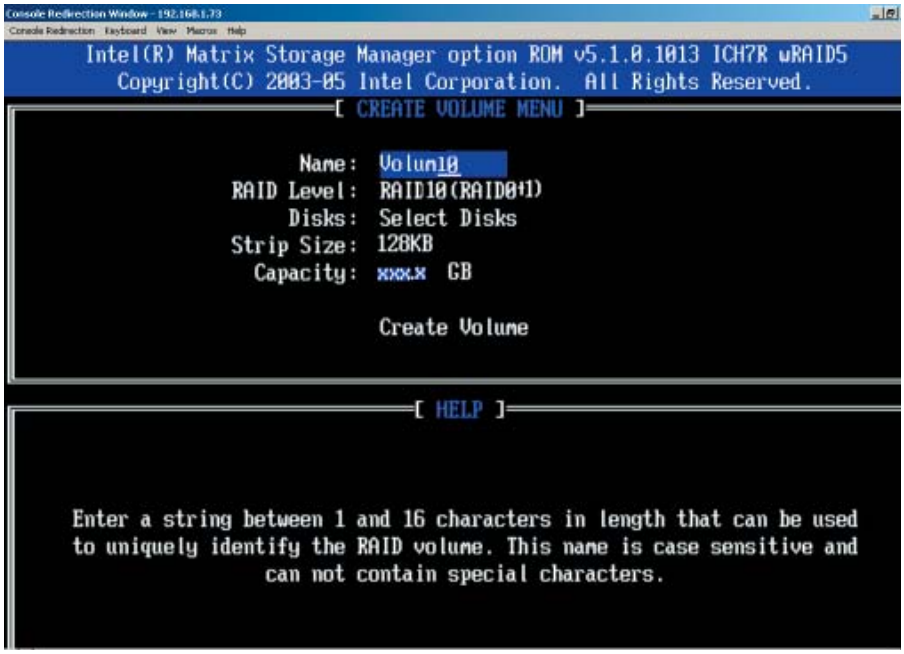
d. When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

e. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

f. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volum10
RAID Level: RAID10(RAID0+1)
Disks: Select Disks
Strip Size: 128KB
Capacity: xxx.x GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the **RAID 10** set and press <Enter>.

c. When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 10 (RAID1 + RAID0)** and hit <Enter>.

d. When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 6 4KB. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.)

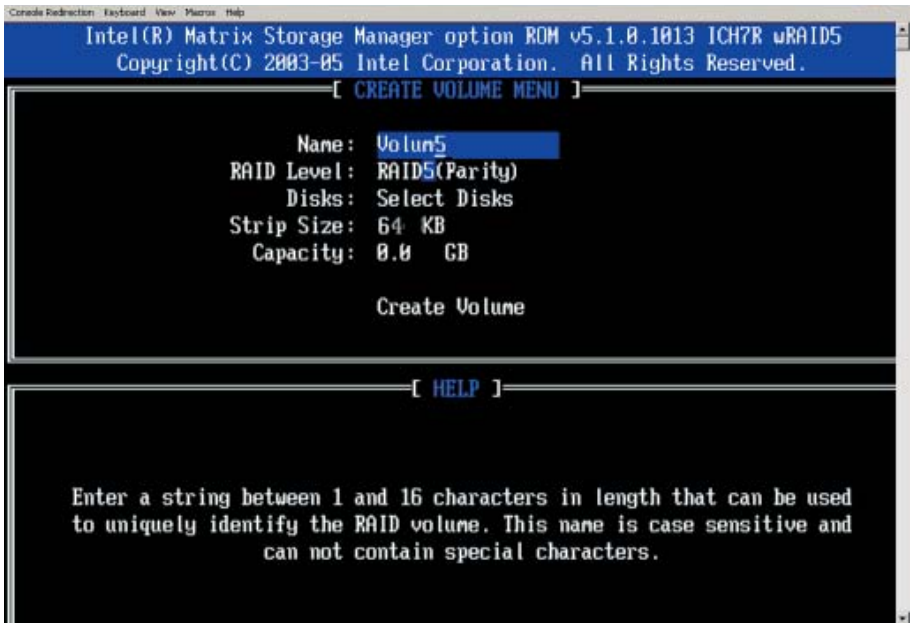
e. When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

f. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

f. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volum5
RAID Level: RAID5(Parity)
Disks: Select Disks
Strip Size: 64 KB
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the **RAID 5** set and press <Enter>.

c. When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select **RAID 5 (Parity)** and hit <Enter>.

d. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See Note on Page C-3) displays:

[SELECT DISKS]
Port Drive Model Serial # Size Status
0 WDC WD2500SD-01KCB0 WD-WMAL72A34971 232.9GB Non-RAID Disk
1 WDC WD2500SD-01KCB0 WD-WMAL72B34599 232.9GB Non-RAID Disk
2 WDC WD2500JD-00FYB0 WD-WMAEH1376109 232.9GB Non-RAID Disk
3 WDC WD2500JD-00FYB0 WD-WMAEH1449527 232.9GB Non-RAID Disk
Select 2 to 4 disks to use in creating the volume.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete

e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranged from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>. (*Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)

g. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.

h Press Enter when Create Volume is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume:

(Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.)

a. From the main menu, select item2-Delete RAID Volume, and press <Enter>.

b. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press <Del>. A Warning message displays.

c. When asked "Are you sure you want to delete this volume (Y/N), press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD

(**Warning:** Be cautious when you reset a RAID volume HDD to non-RAID or Resetting a RAID HDD. Resetting a RAID volume HDD or Restting a RAID HDD will reformat the HDD and delete all internal RAID structure on the drive.)

a. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:

Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures,
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost
Port Drive Model Serial # Size Status
1 WDC WD2500SD-01KCB0 WD-WMAL72034599 232.9GB
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

b. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select.

c. Press <Enter> to reset the RAID set drive. A Warning message displays.

d. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

a. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.

b. Press "Y" to reset the drive, or type "N" to go back to the main menu.

C-2 Installing the Windows XP/2000/2003 for systems with RAID Functions

New Operating System-Windows XP/2000/2003 Installation

a. Insert Microsoft Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

b. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

c. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

d. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH7R into Drive A: and press the <Enter> key.

e. Choose Intel(R)82801GR/GH *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

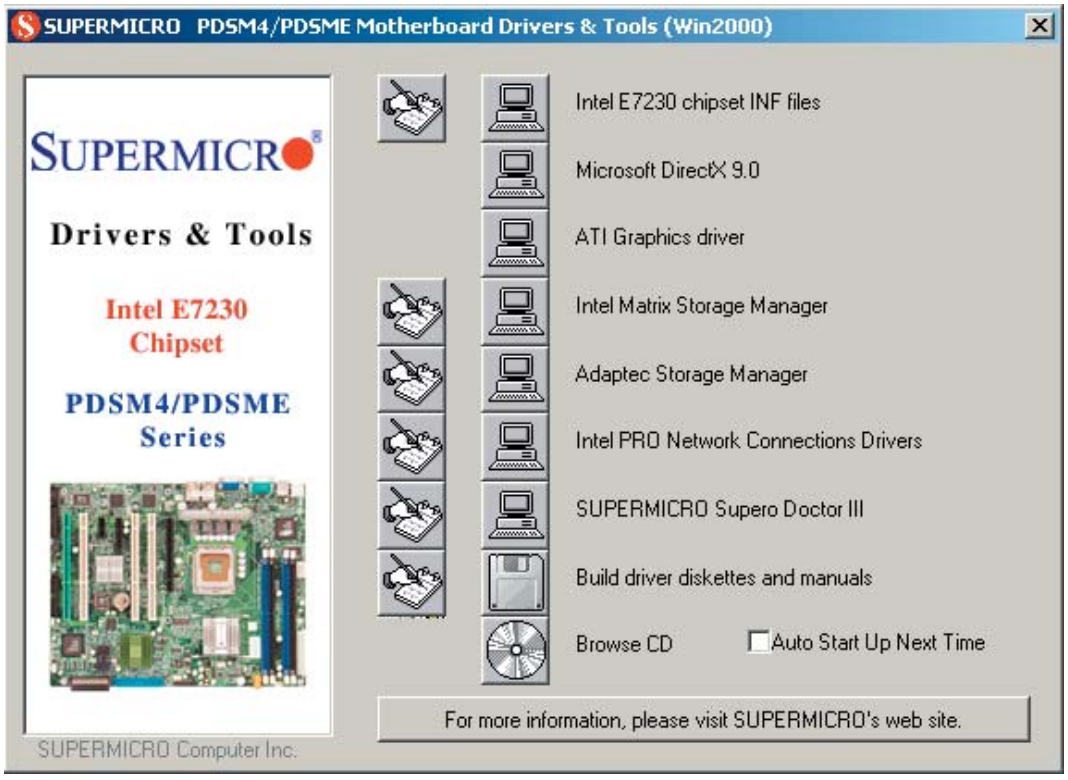
f. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

g. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

h. After Windows XP/2000/2003 Installation is completed, the system will automatically reboot.

i. Insert Supermicro CD that came with the package into the CD Drive during system reboot, and the following screen will appear:

Note: the current version of the ICH7R SATA RAID Utility can only support Windows XP/2000/2003 Operating System.



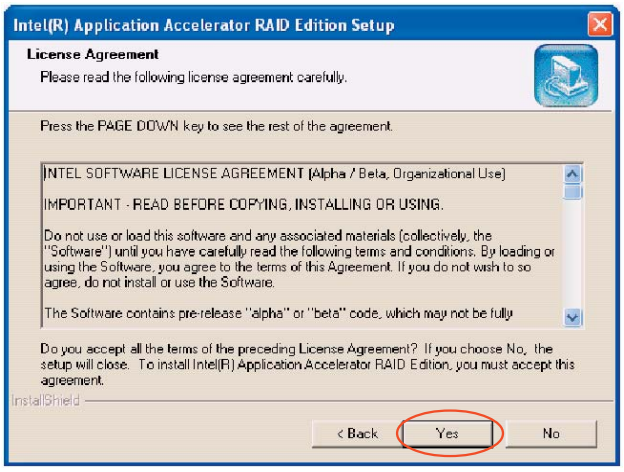
Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

C-3 Installing Intel Application Accelerator Utility

a. When the above screen appears, click on the icon marked "Application Accelerator RAID Edition" on the screen, and the following screen will appear:

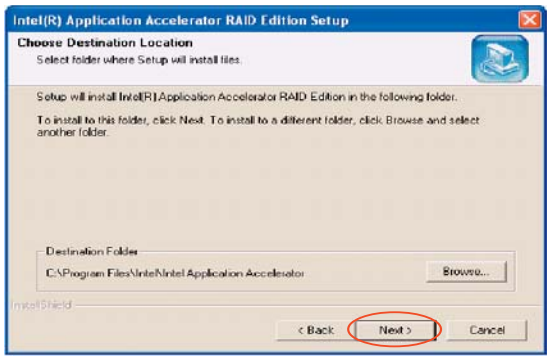
Intel(R) Application Accelerator RAID Edition Setup
Welcome to the InstallShield(R) Wizard for Intel(R) Application Accelerator RAID Edition
The InstallShield(R) Wizard will install Intel(R) Application Accelerator RAID Edition on your computer. To continue, click Next.
< Back
Next >
Cancel

b. When the above screen appears, click on the icon marked "Next" on the screen, and the following screen will appear:


Intel(R) Application Accelerator RAID Edition Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
The Software contains pre-release "alpha" or "beta" code, which may not be fully
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Application Accelerator RAID Edition, you must accept this agreement.
InstallShield
< Back
Yes
No

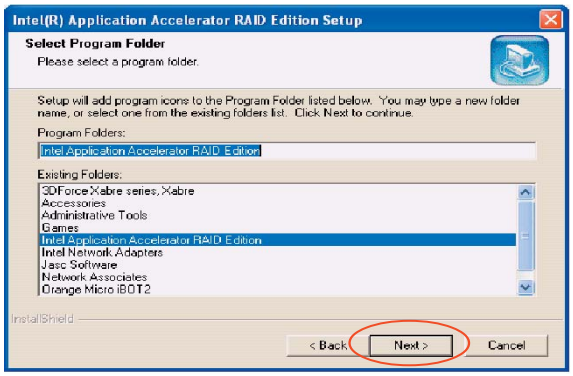
c. After reading the License Agreement, click on the icon marked "Yes" on the screen, and the following screen will appear:

d. Specify the folder that you want the program to be installed in and then, click on the icon marked "Next" to begin the installation process.

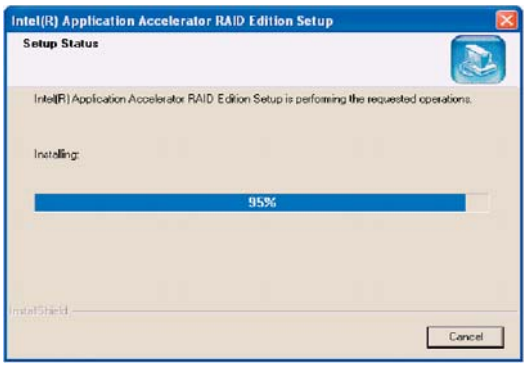

Intel(R) Application Accelerator RAID Edition Setup
Choose Destination Location
Select folder where Setup will install files.
Setup will install Intel(R) Application Accelerator RAID Edition in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\Intel\Intel Application Accelerator
Browse...
InstallShield
< Back
Next >
Cancel

16

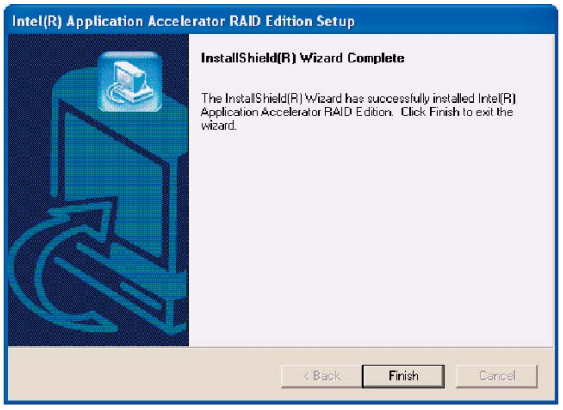
e. Specify a program folder where you want the Setup to add the program icon as shown in the following screen and click on the icon marked "Next".


Intel(R) Application Accelerator RAID Edition Setup
Select Program Folder
Please select a program folder.
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing folders list. Click Next to continue.
Program Folders:
Intel Application Accelerator RAID Edition
Existing Folders:
3DForce Xabre series, Xabre
Accessories
Administrative Tools
Games
Intel Application Accelerator RAID Edition
Intel Network Adapters
Jasc Software
Network Associates
Orange Micro iBOT2
InstallShield
< Back
Next >
Cancel

f. The following screen will appear to display the status of the Intel Application Accelerator RAID Edition Installation.



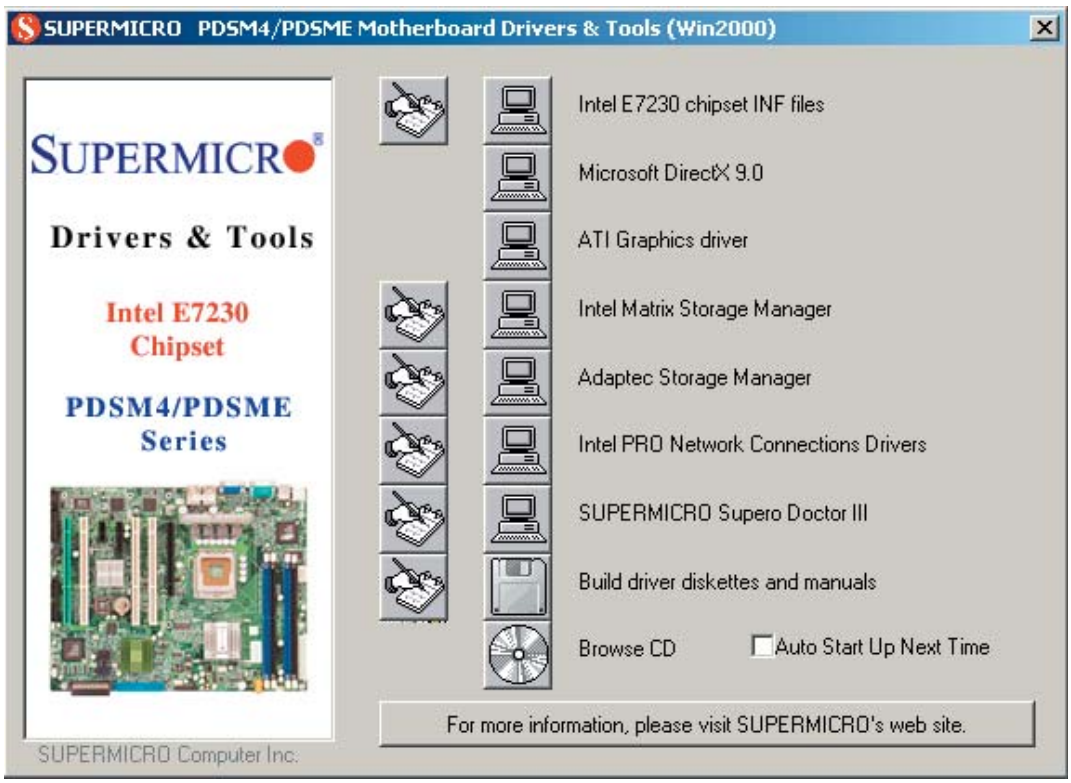
g. Once the Application Accelerator RAID Edition installation is completed, the following screen will appear and the system will start to re-boot.


Intel(R) Application Accelerator RAID Edition Setup
InstallShield(R) Wizard Complete
The InstallShield(R) Wizard has successfully installed Intel(R) Application Accelerator RAID Edition. Click Finish to exit the wizard.
< Back
Finish
Cancel

Note: Once the XP/2000/2003 Operating System is installed, please read the "Readme text files" for the instructions to use the SATA RAID Utility in the Windows XP/2000/2003 OS environment.

C-4 Installing the Operating System and other Software Programs

After all the hardware has been installed, you must first install the operating system, and then, other software drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard. (For Windows 2003 please refer to Page C-14.)



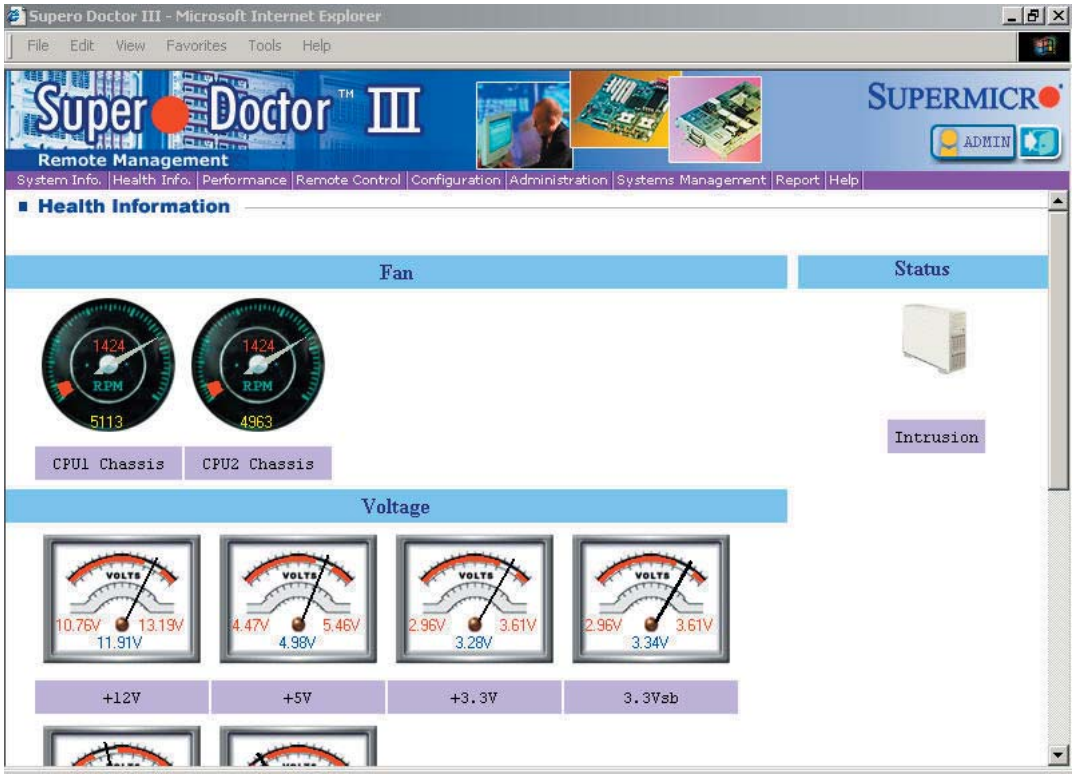
Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Supero Doctor III

The Supero Doctor III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Supero Doctor III Interface Display Screen-I (Health Information)



Supero Doctor III Interface Display Screen-II (Remote Control)

Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: SD III Software Revision 1.0 can be downloaded from our Website at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend Supero Doctor II.

Notes

Appendix D

Adaptec HostRAID Setup Guidelines

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard. *Note: The following section provides information on the Adaptec SATA RAID Driver based on the Intel Enterprise South Bridge 2 (ICH7R) Controller.*

D-1 Adaptec's Embedded SATA RAID Controller Driver

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates up to 3.0 Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Intel ICH7R Controller Hub

Located in the South Bridge of the chipset, the ICH7R Controller Hub provides the I/O subsystem with access to the rest of the system. It supports 1-channel Ultra ATA/100 Bus Master IDE controller (PATA) and an Adaptec's firmware, which support up to four Serial ATA drives, up to two RAID volumes and up to four drives in RAID Configurations. (See the table below for details.)

*** Adaptec's SATA HostRAID Controller Firmware supports:**	
Drives supported	Four
Number of RAID Volumes supported	Two
Total Drives in RAID Configurations	Four
Examples of Valid RAID Configurations:	
Two drives of RAID 1 + two drives of RAID 0	
Two drives of RAID 1 + two drives of RAID 1	
Three drives of RAID 0	
Four drives of RAID 0	
Examples of Invalid RAID Configurations:	
Three drives of RAID 0 + two drives of RAID 1	
(***Note**: this table is applicable to Adaptec's HostRAID Controller Firmware only.)	

To configure the Adaptec SATA RAID for Operating Systems that support RAID functions (Windows, Red Hat & SuSe, Linux)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA Control Mode" and press the <Enter> key to select "Enhanced"

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled."

6. Scroll down to "ICH RAID Codebase" and select "Adaptec". Then press <Enter>. (*For ICH RAID Codebase: Change the setting from Intel to Adaptec.)

7. Scroll down to "Exit". Select "Exit Saving Changes" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

8. Once you've exited the BIOS Utility, the system will re-boot.

9. During the system boot-up, press the <Ctrl> and <A> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <A> for* Intel *RAID Configuration Utility*.

Serial ATA with HostRAID Controller Driver

The Adaptec Embedded Serial ATA RAID Controller adds SATA/RAID functionality and performance enhancements to a motherboard. RAID striping (RAID 0) allows data to be written across multiple drives, greatly improving hard disk I/O performance. RAID mirroring (RAID 1) allows data to be simultaneously written to two drives, improving data security even if a single hard disk fails. A Stripe of Mirrors (RAID 10) provides multiple RAID 1 mirrors and a RAID 0 stripe, maximizing data security and system efficiency. By incorporating the Adaptec Embedded Serial ATA into the motherboard design, Supermicro's PDSM4+/PDSME+ offers the user the benefits of SATARAID without the high costs associated with hardware RAID applications.

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility, an embedded BIOS Utility, includes the following:

*Array Configuration Utility: Use this utility to create, configure and manage arrays.

* Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to do the following:

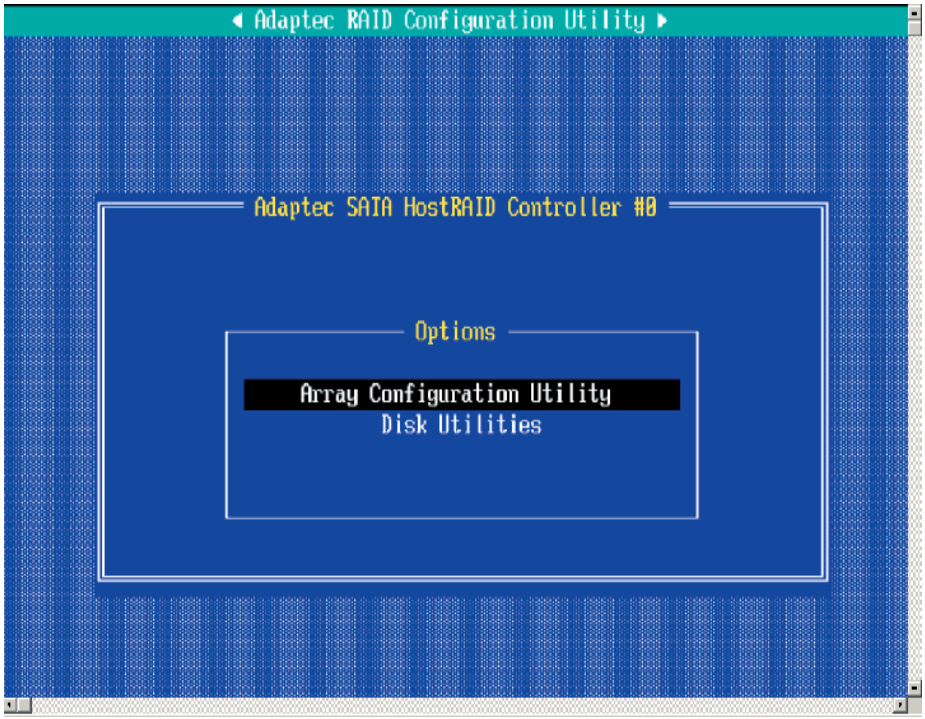
1. Enable RAID functions in the system BIOS (refer to Chapter 4 for System BIOS Configurations).

2. Press the <Ctrl> and <A> keys simultaneously when prompted to do so during system boot. (Refer to the previous page for detailed instructions.)

A. Using the Array Configuration Utility (ACU)

When you press <Ctrl> and <A> keys simultaneously at the prompt during system bootup, the main menu will appear.

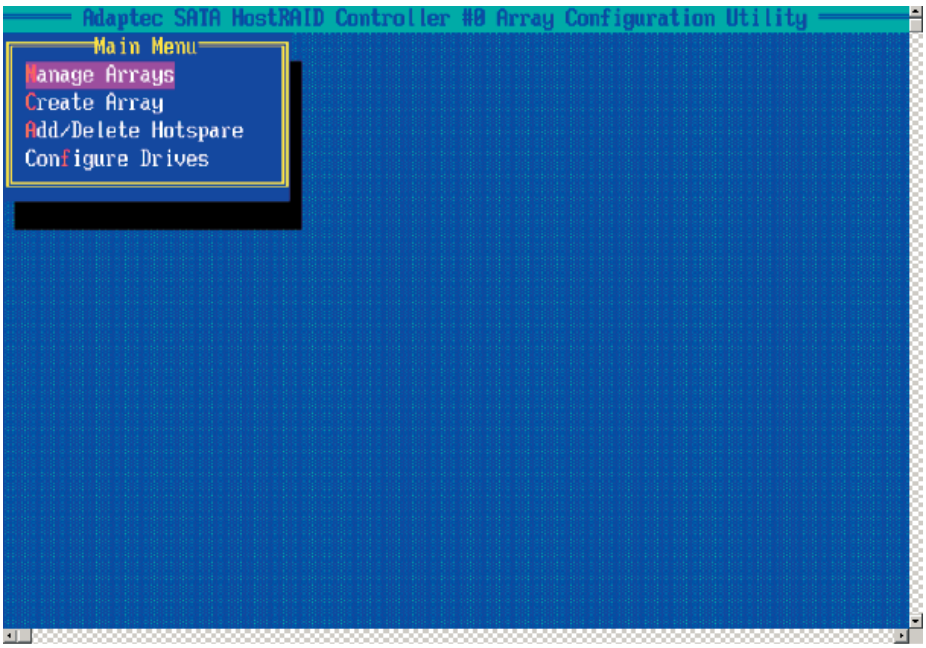
Note: To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key. Press the <Insert> key to select a drive. When a drive is highlighted (selected), press the <Delete> key to de-select it.



Managing Arrays

Select this option to view array properties, and configure array settings.

To select this option, using the arrow keys and the <enter> key, select "Managing Arrays" from the main menu as shown above.



Configuring Disk Drives

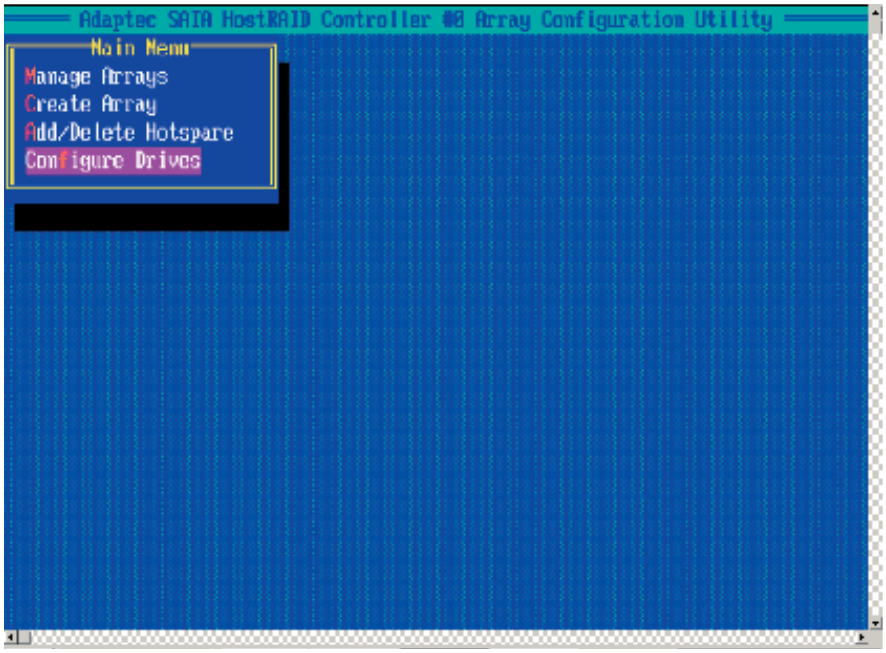
You may need to configure a disk drive before you can use it.

Caution: Configuring a disk may overwrite the partition table on the disk and may make any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

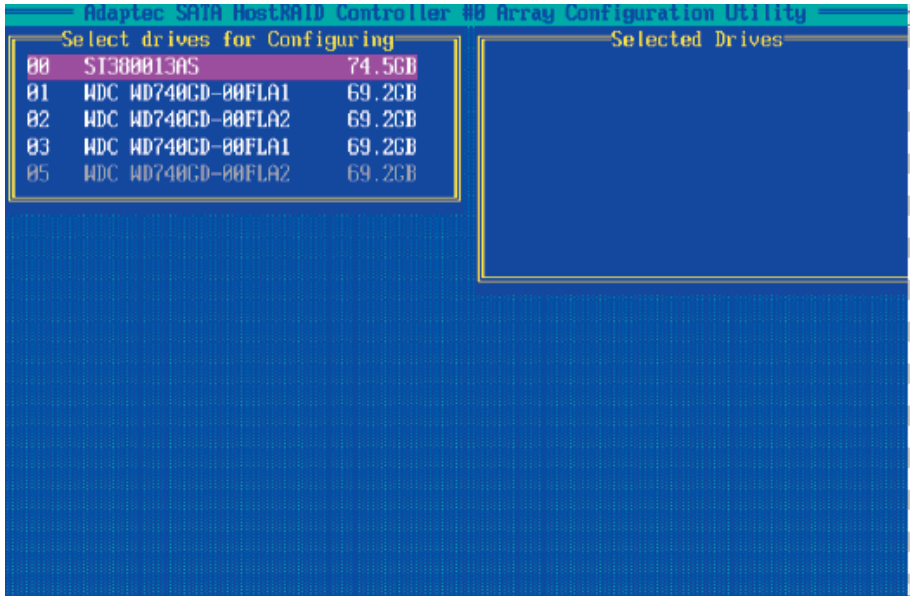
Do not configure a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to *Viewing Array Properties.*

To configure a disk drive:

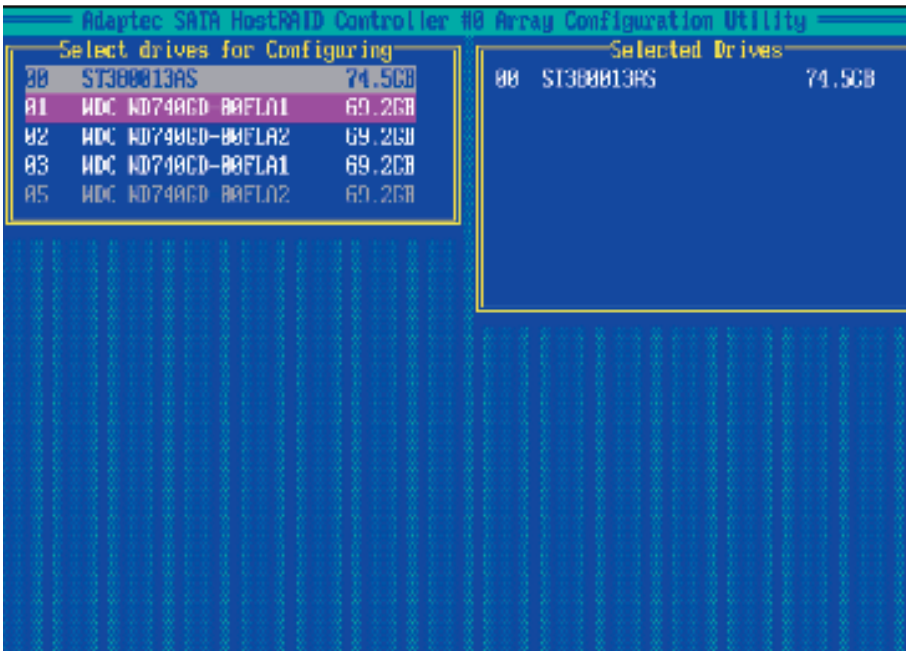
1. From the main menu (shown on Page D-4), select **Configure Drives** and hit <**Enter**> (as shown below.)



2. From the "Select Drives for Configuring" List (shown below,) select the drives you want to configure and press <**Insert**>.

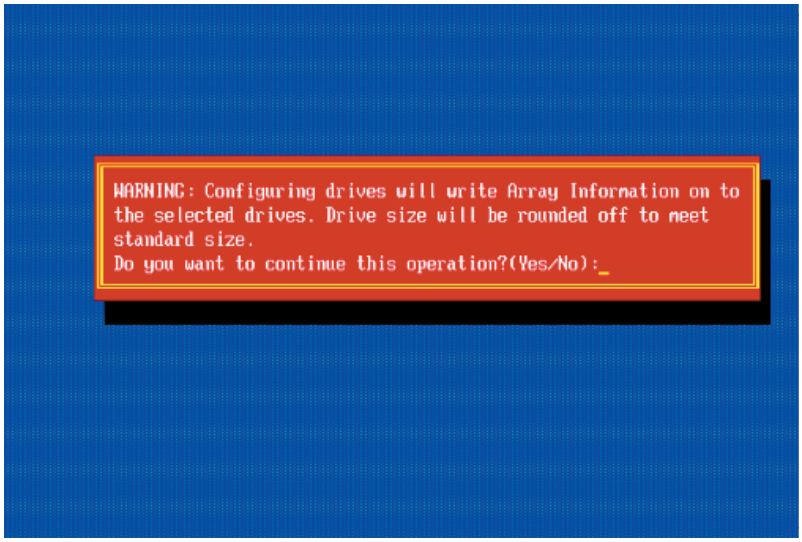

Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives for Configuring
00 ST380013AS 74.5GB
01 WDC WD740GD-00FLA1 69.2GB
02 WDC WD740GD-00FLA2 69.2GB
03 WDC WD740GD-00FLA1 69.2GB
05 WDC WD740GD-00FLA2 69.2GB
Selected Drives

3. The drive you've selected will appear in the "Selected Drives Dialog Box" on the right (as shown below.) Repeat the same steps until all drives that you want to configure appear in the selected drives box.


Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives for Configuring
00 ST380013AS 74.5GB
01 WDC WD740GD-00FLA1 69.2GB
02 WDC WD740GD-00FLA2 69.2GB
03 WDC WD740GD-00FLA1 69.2GB
05 WDC WD740GD-00FLA2 69.2GB
Selected Drives
00 ST380013AS 74.5GB

4. Once both drives display in the selected drive box, press <**Enter**.>

5. Read the warning message as shown in the screen below.


WARNING: Configuring drives will write Array Information on to the selected drives. Drive size will be rounded off to meet standard size.
Do you want to continue this operation?(Yes/No):_

6. Make sure that you have selected the correct disk drives to configure. If correct, type **Y** to continue.

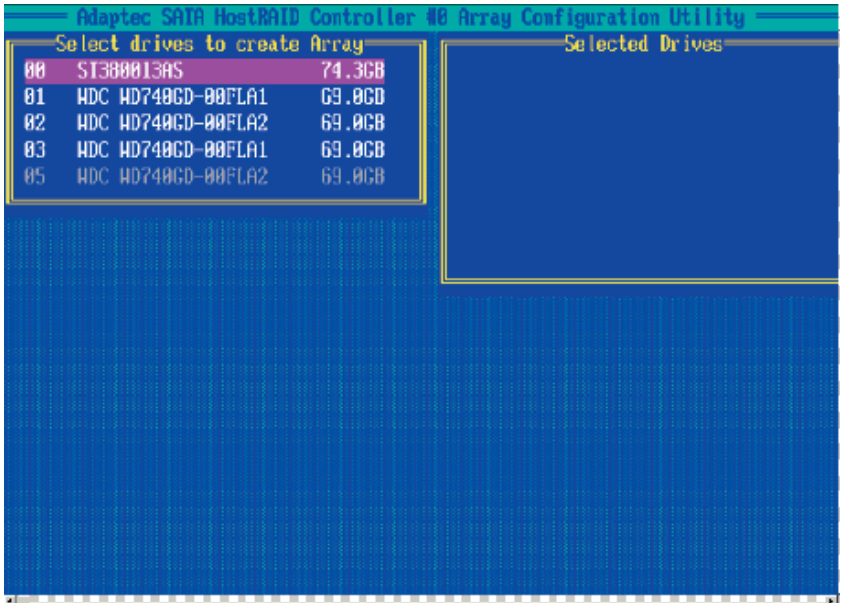
Creating Arrays

Before you create arrays, make sure that the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized or not formatted are shown in gray and cannot be used. (***Note**: It is recommended that you configure devices before you create arrays.)

To create an array:

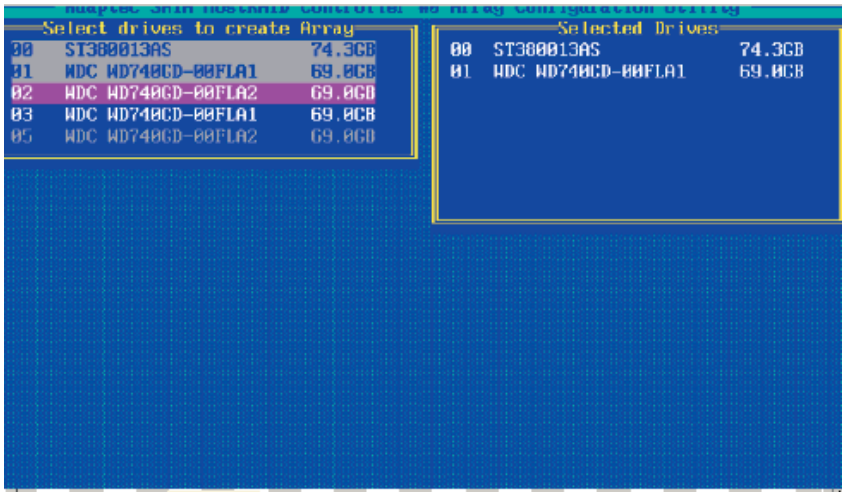
1. From the main menu (shown on page D-4), select **Create Array**.

2. Select the disks for the new array and press Insert (as the screen shown below). **(*Note:** To de-select any disk, highlight the disk and press **Delete**.)


Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives to create Array
00 ST380013AS 74.3GB
01 WDC WD740GD-00FLA1 69.0GB
02 WDC WD740GD-00FLA2 69.0GB
03 WDC WD740GD-00FLA1 69.0GB
05 WDC WD740GD-00FLA2 69.0GB
Selected Drives

3. The arrays you have selected will appear on the Selected Drives dialog box on the right (as shown below.)

4. Press **Enter** when both disks for the new array are selected. The Array Properties menu displays.



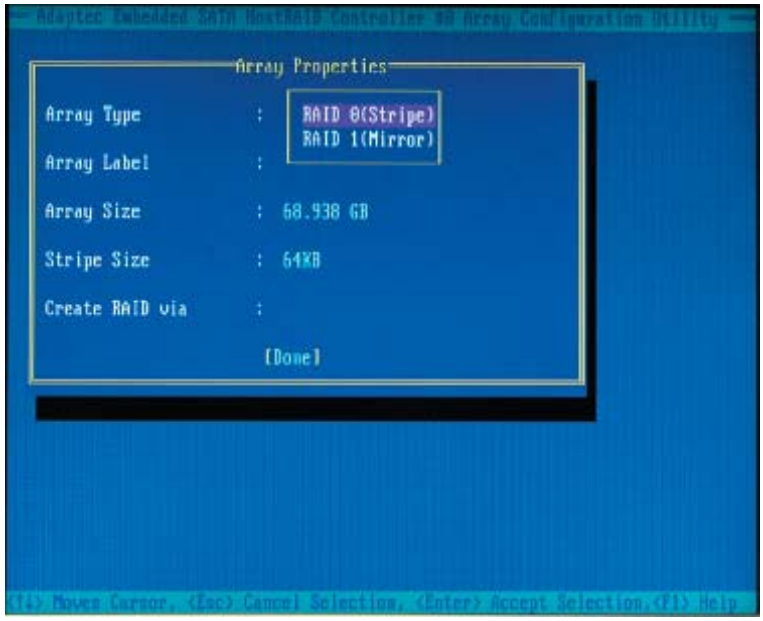
Assigning Array Properties

Once a new array is completed, you can assign properties to the array.

***Caution:** Once the array is created and its properties are assigned, and you cannot change the array properties using this utility.

To assign properties to the new array:

1. In the Array Properties menu (as shown in the screen below), select an array type and press **Enter**. Only the available array types will be displayed on the screen. (*RAID 0 or RAID 1 requires two drives.)



2. Under the item "**Arrays Label**", type in a label and press <**Enter>**. (***Note:** The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. (*Note: Available stripe sizes are 16, 32, and 64 KB. 64K is default. Please *do not* change the default setting.)

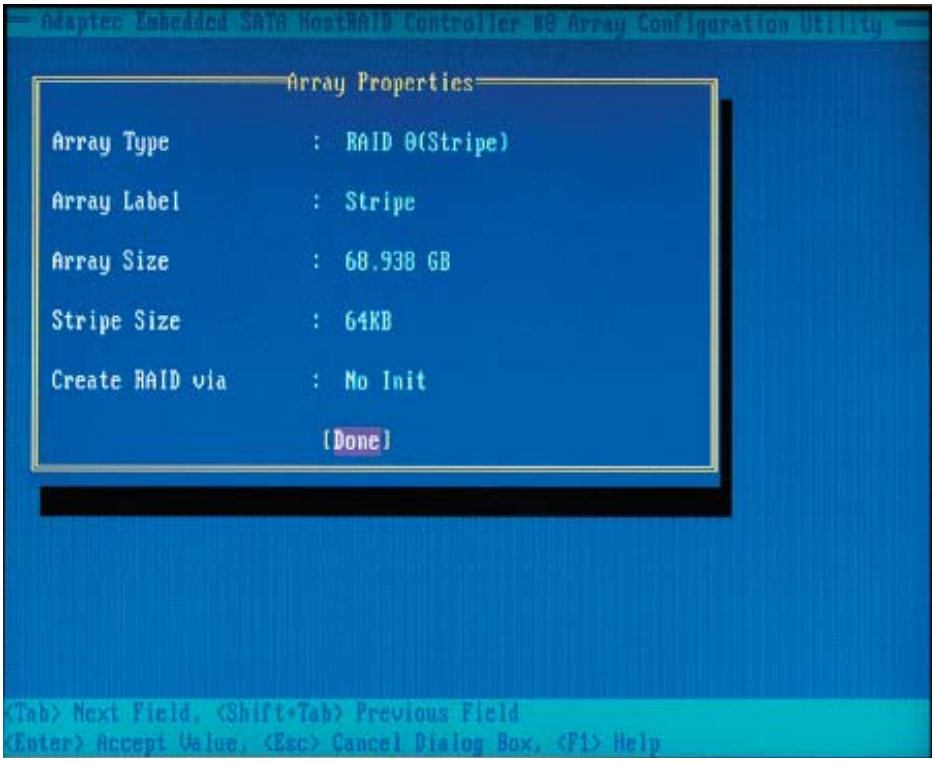
4. The item: **"Create RAID via"** allows you to select between the different ways of creating methods for RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	Quick Init	Creating a RAID 0 on new drives
RAID 0	Migrate*	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build*	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1, RAID 10	Clear	Creating a RAID 1 or RAID 10 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1, RAID 10	Quick Init	Fastest way to create a RAID 1 or RAID 10 Appropriate when using new drives

(*Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.)

5. When you are finished, press **<Done>** (as the screen shown below).


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Array Properties
Array Type : RAID 0(Stripe)
Array Label : Stripe
Array Size : 68.938 GB
Stripe Size : 64KB
Create RAID via : No Init
[Done]
<Tab> Next Field, <Shift+Tab> Previous Field
<Enter> Accept Value, <Esc> Cancel Dialog Box, <F1> Help

Notes:

1. Before adding a new drive to an array, be sure to back up any data stored on the new drive; otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1, you can restart it by pressing <Ctrl> and <R>.

3. If you've used the Quick Init option to create a RAID1, it may return some data mis-comparison when you run a consistency check at a later time. This is normal.

4. The Adaptec Host RAID allows you to use drives of different sizes in a RAID. However, you can only select a smaller drive as the source or first drive during a build operation.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. It is not recommended that you migrate or build an array on Windows dynamic disks (volumes) because it will result in data loss.

Warning: Do not interrupt the process when you create a RAID 0 using the Migrate option. If you do, you will not be able to restart the system, or to recover the data that was on the source drive.

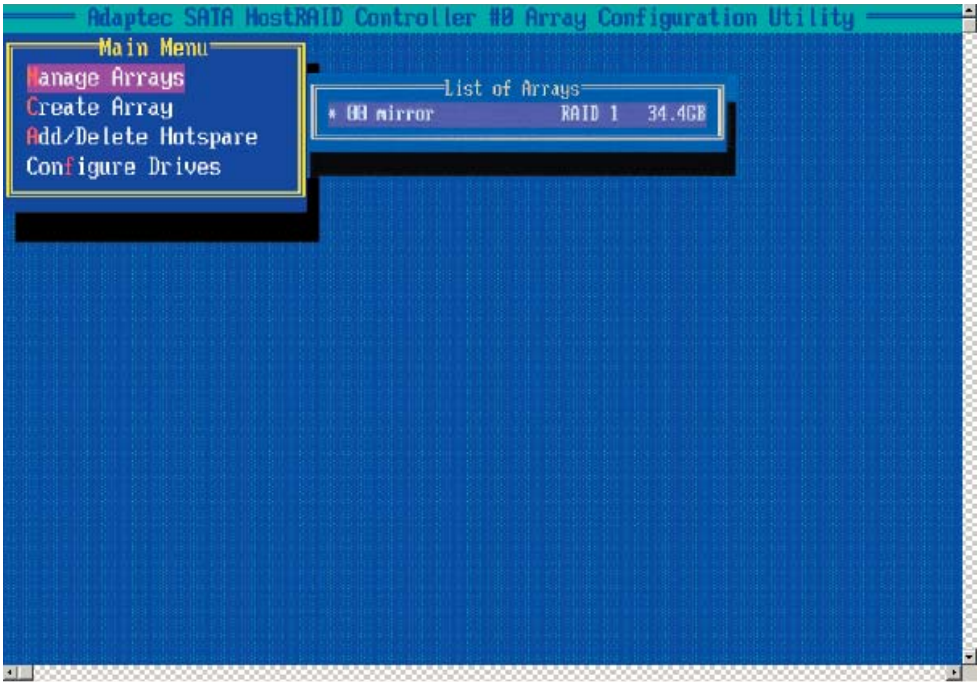
Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the array you want to make bootable, and press <**Ctrl>** and **<B>.**

3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk (*) will appear next to the bootable array (as shown in the picture below:)



Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select **Manage Arrays.**

2. From the List of Arrays, select the bootable array you want to delete, and press <**Ctrl>** and **<B>**. Note: a bootable array is the array marked with an asterisk * (as shown in the picture above.)

3. When the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No)," Enter Y to delete a bootable array. The bootable array will be deleted and the asterisk will disappear.

(*Note: Do not use the delete key to delete the bootable array.)

Adding/Deleting Hotspares

To add a Hotspare:

(*Note: In order to rebuild a RAID (RAID 0 or RAID 1), you would need to add a new HDD as a hotspare.)

1. From the main menu (shown on Page D-4), select Add/Delete Hotspares.

2. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press <Insert>, and then, press <**Enter**>.

3. Press **Yes** when the following prompt is displayed:

"Do you want to create spare?" (Yes/No?)

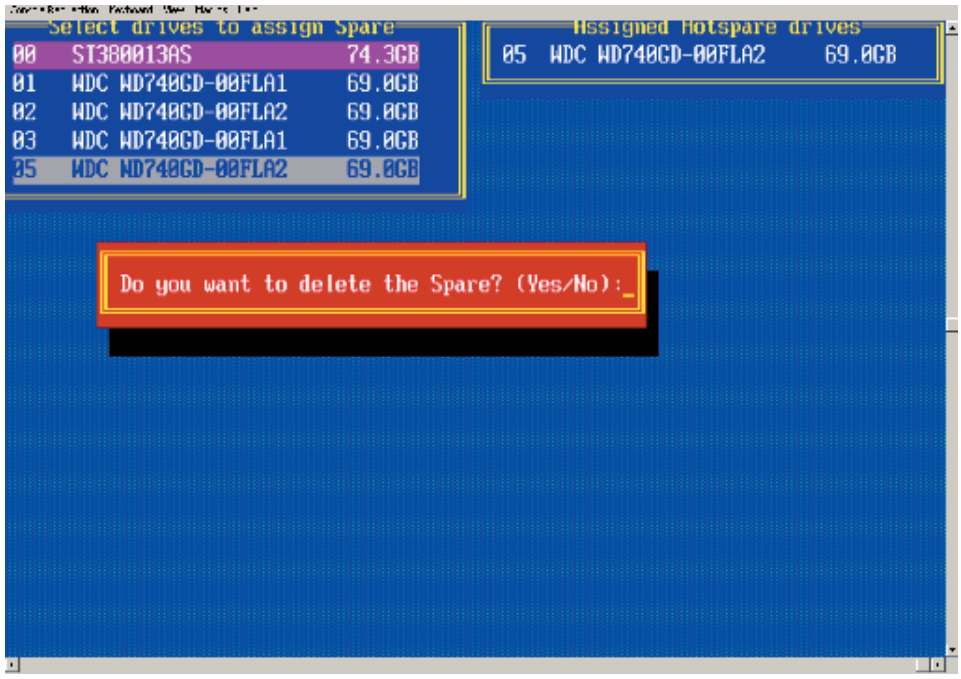
The spare you have selected will appear in the Selected drives Menu.

To delete a Hotspare:

1. From the main menu (shown on Page D-4), select Add/Delete Hotspares.

2. Use the up and down arrow keys to highlight and select the Hotspare you want to delete, and press <delete>, and then, press <Enter>.

3. When the following warning is displayed: "Do you want to delete the hot spare?" (Yes/No?), press **Yes** to delete the hotspare you have selected.


Select drives to assign Spare
00 ST380013AS 74.3GB
01 WDC WD740GD-00FLA1 69.0GB
02 WDC WD740GD-00FLA2 69.0GB
03 WDC WD740GD-00FLA1 69.0GB
05 WDC WD740GD-00FLA2 69.0GB
Assigned Hotspare drives
05 WDC WD740GD-00FLA2 69.0GB
Do you want to delete the Spare? (Yes/No):_

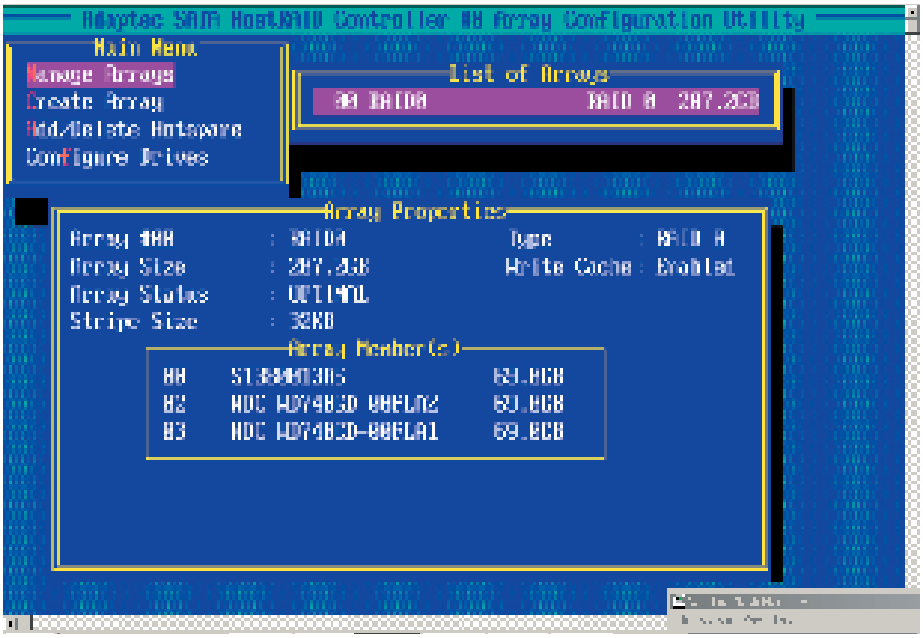
Viewing Array Properties

To view the properties of an existing array:

1. From the main menu, select **Manage Arrays** and hit <Enter> (as shown on the previous page.)

2. From the List of Arrays dialog box (shown below), select the array you want to view and press **Enter**.

The Array Properties dialog box appears (as shown below), showing detailed information on the array. The physical disks associated with the array are displayed here.



3. Press **Esc** to return to the previous menu.

Rebuilding Arrays

***Note 1:** Rebuilding applies to Fault Tolerant array (RAID 1) only.

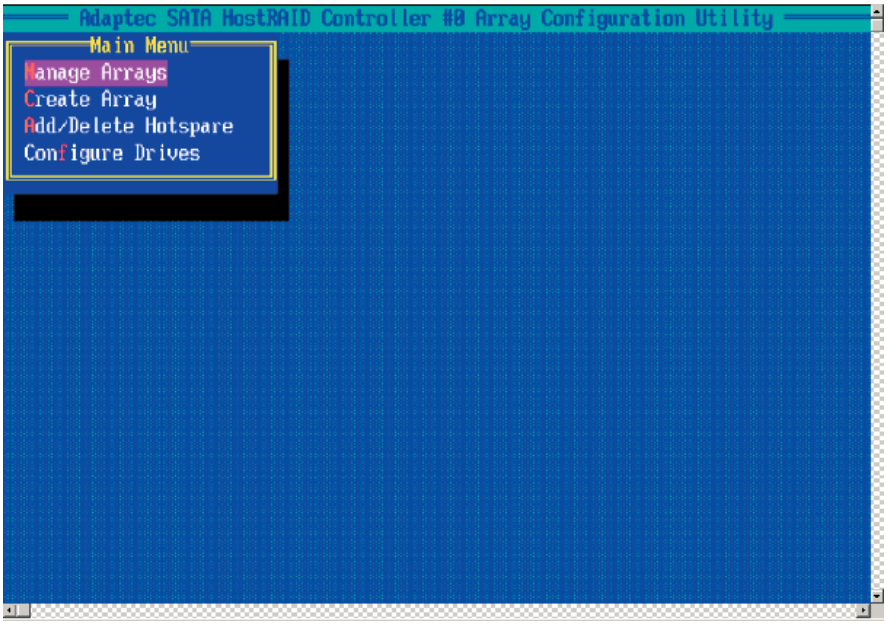
If an array Build process is interrupted or when one critical member is missing, you must perform a Rebuild to restore its functionality. For a critical array rebuild operation, the optimal drive is the source drive.

***Note 2:** If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1 From the Main Menu, select **Manage Arrays** (as shown in the screen below). From the List of Arrays, select the array you want to Rebuild.

2 Press <**Ctrl**> and **<R>** to Rebuild.



Deleting Arrays

**Warning: Back up the data on an array before you delete it to prevent data loss Deleted arrays cannot be restored.*

To delete an existing array:

1. From the main menu (shown on Page D-4), select **Manage Arrays**.

2. Select the array you wish to delete and press <de**lete**>.

3. In the Array Properties dialog box, select **Delete** and press <**Enter>**. The following prompt is displayed:
**Warning!! Deleting the array will render array unusable. Do you want to delete the array? (Yes/No):*

***RAID 1 only*—the following prompt is also displayed:**

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

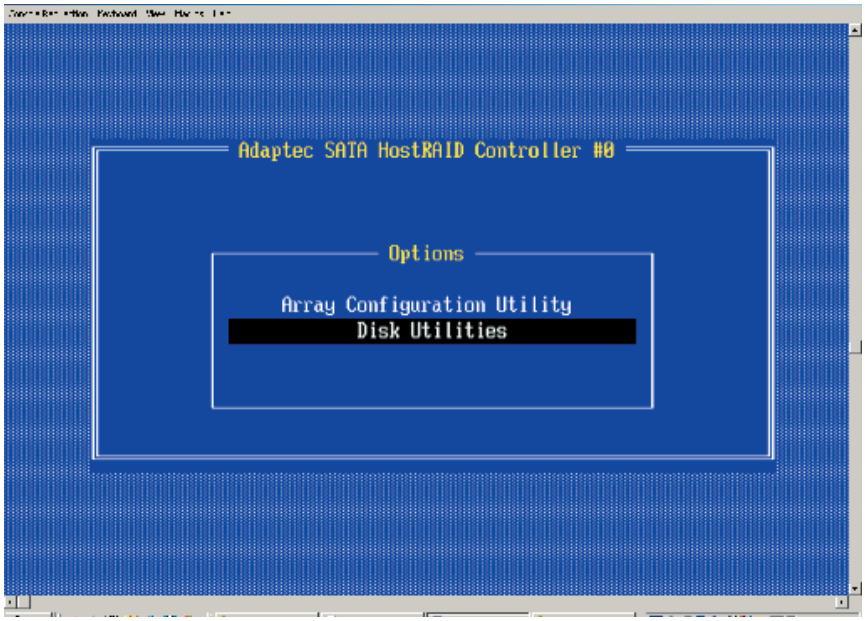
4. Press **Yes** to delete the array and partition or **No** to return to the previous menu.

5. Press **Esc** to return to the previous menu.

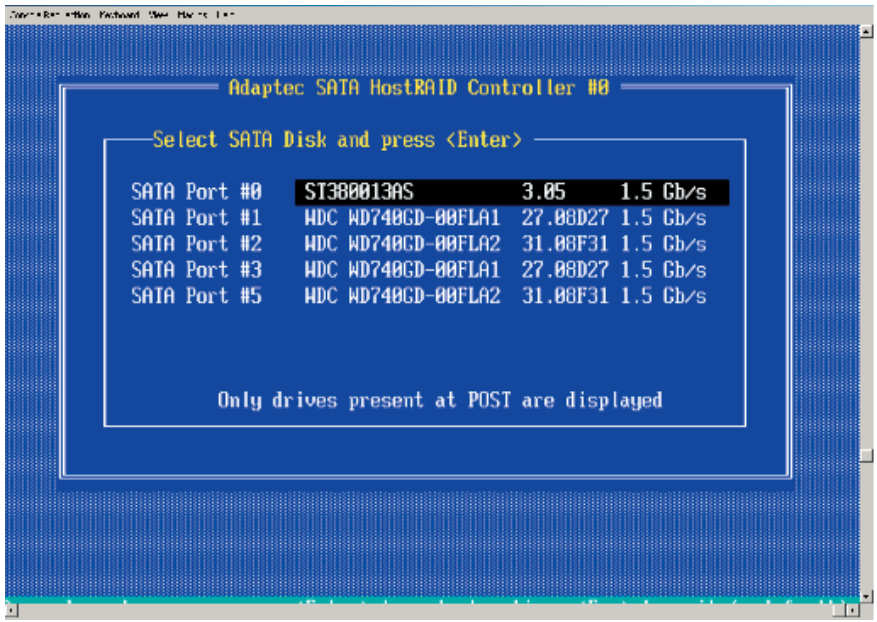
Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:



1. From the Adaptec RAID Configuration Utility Menu, select **Disk Utilities** (as shown above) and press **<Enter>.** The following screen appears.

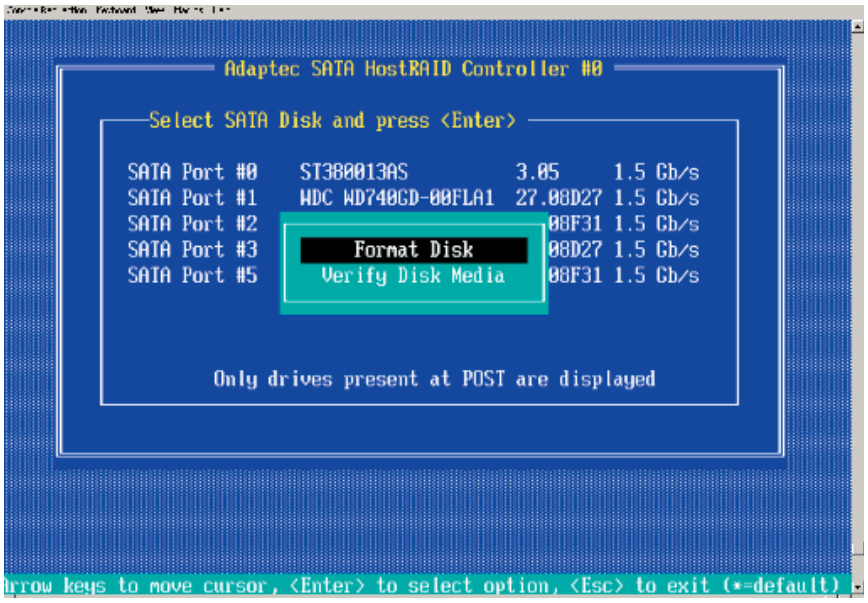

Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.00D27 1.5 Gb/s
SATA Port #2 WDC WD740GD-00FLA2 31.00F31 1.5 Gb/s
SATA Port #3 WDC WD740GD-00FLA1 27.00D27 1.5 Gb/s
SATA Port #5 WDC WD740GD-00FLA2 31.00F31 1.5 Gb/s
Only drives present at POST are displayed

2. Select the desired disk and press **<Enter>**. The following screen appears:

To format a disk:

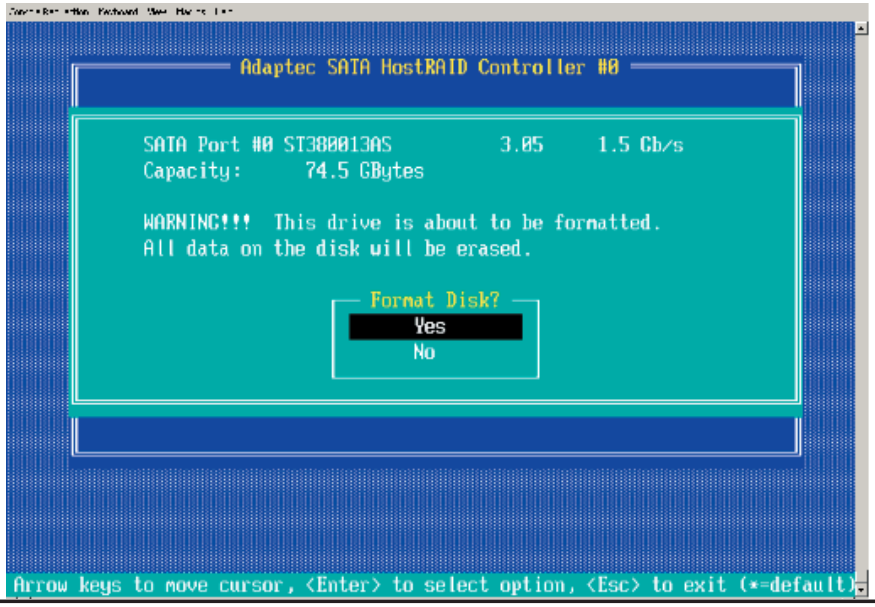
***Note:** The operation of **Formatting Disk** allows you to perform a low-level formatting of a hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

3 When the screen shown below displays, select **Format Disk** and press **<Enter>**. The following screen appears:

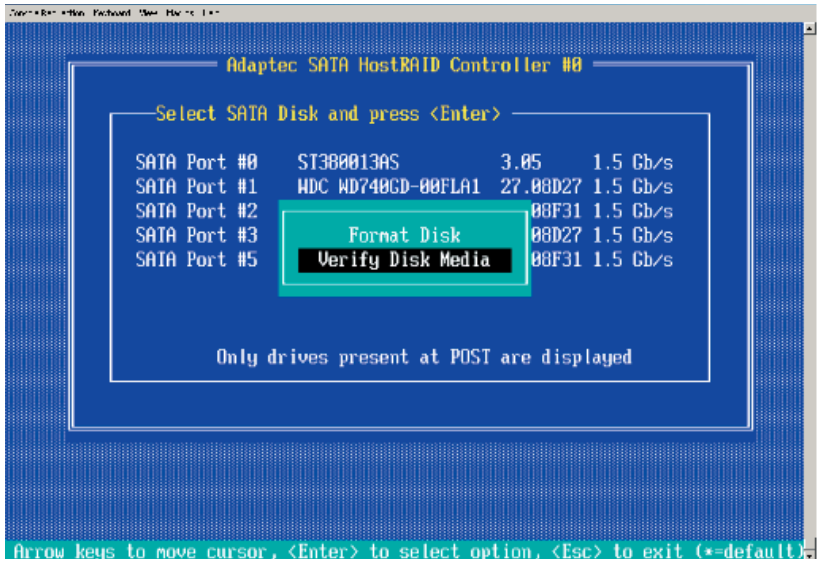

Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.00D27 1.5 Gb/s
SATA Port #2 00F31 1.5 Gb/s
SATA Port #3 00D27 1.5 Gb/s
SATA Port #5 00F31 1.5 Gb/s
Format Disk
Verify Disk Media
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

4 Read the warning message when it appears in the screen as shown below. To continue with disk formatting, select **Yes** and hit **<Enter>.** Otherwise, select **No** and press **<Enter>**.

(*Caution: Formatting a disk destroys all data on the drive. Be sure to back up your data before formatting a disk.)

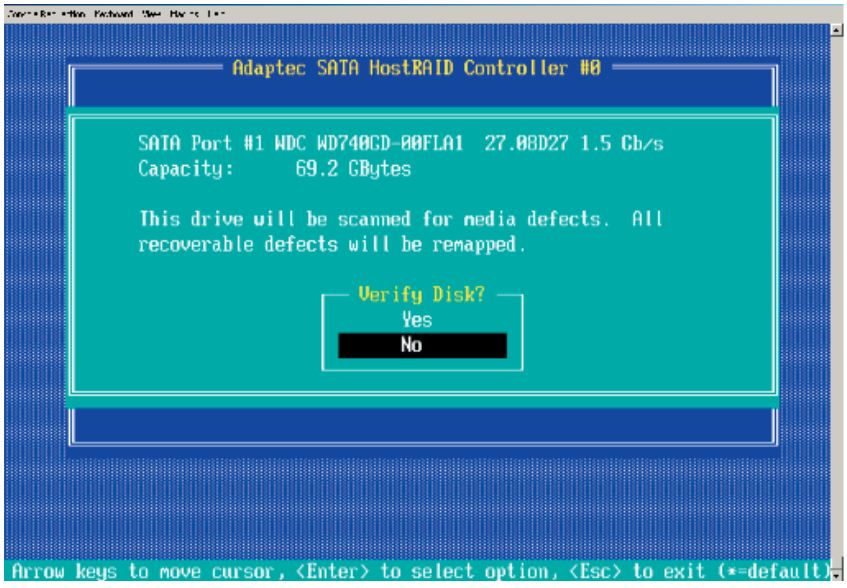

Adaptec SATA HostRAID Controller #0
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
Capacity: 74.5 GBytes
WARNING!!! This drive is about to be formatted.
All data on the disk will be erased.
Format Disk?
Yes
No
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

To verify disk media:


Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.08D27 1.5 Gb/s
SATA Port #2 08F31 1.5 Gb/s
SATA Port #3 08D27 1.5 Gb/s
SATA Port #5 08F31 1.5 Gb/s
Format Disk
Verify Disk Media
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

3 When the screen shown above displays, select **Verify Disk Media** and press **<Enter>**.

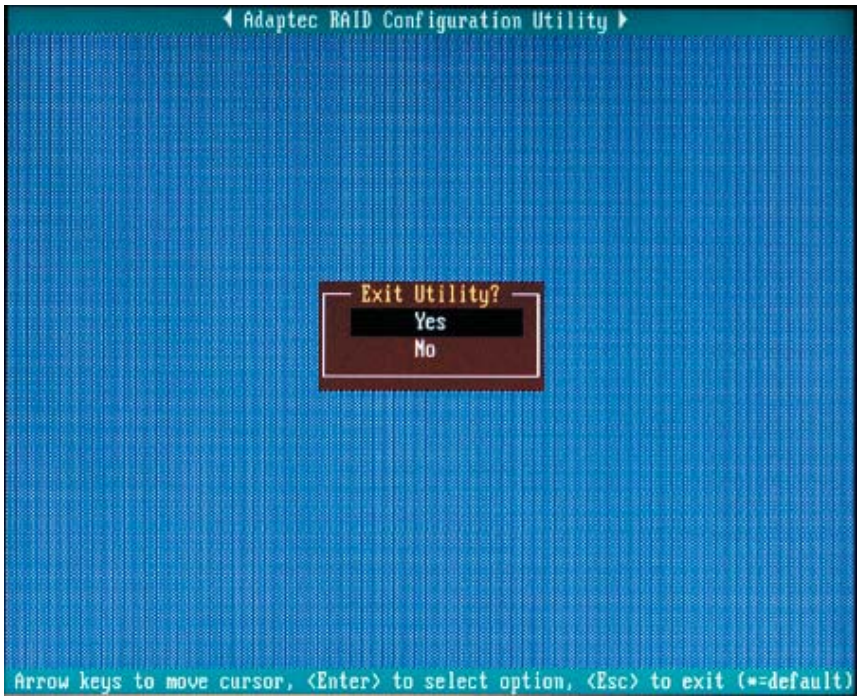
4 A message will display, indicating that the selected drive will be scanned for media defects. Select **Yes** and hit **<Enter>** to proceed with disk verifying; otherwise, select **No and** hit **<Enter>.**


Adaptec SATA HostRAID Controller #0
SATA Port #1 WDC WD740GD-00FLA1 27.08D27 1.5 Gb/s
Capacity: 69.2 GBytes
This drive will be scanned for media defects. All recoverable defects will be remapped.
Verify Disk?
Yes
No
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press **ESC** to exit. The following screen will appear.

2. Press **Yes** to exit the Utility.



D-2 Installing the ICH7R Driver and the OS

a. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot, and the screen: "Super Micro Driver Diskette Maker" will appear.

b. Choose from the list the item: "Intel ICH7R Driver by 3rd Party (Adaptec)" and press <**ENTER**>.

c. From the next screen displayed, choose the OS driver you want to install and press <**Enter**>.

d. Insert a formatted diskette into drive A: and press <**Enter**> as prompted.

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert the Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from CD.

g. Press the <**F6**> key when the message-"Press F6 if you need to install a third party SCSI or RAID driver" displays.

h. When the Windows OS Setup screen appears, press "**S**" to specify additional device(s).

i. Insert the driver diskette-"Adaptec Embedded Serial ATA Raid Controller Driver" into Drive A: and press the <**Enter**> key.

j. Choose Adaptec Embedded Host Serial ATA Raid Controller from the list indicated in the Windows OS Setup Screen, and press the <**Enter**> key.

k. Press the <**Enter**> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <**Enter**> key to continue with the installation.

l. From the Windows OS Setup screen, press <**Enter**>. The OS Setup will automatically load all device files, and, then, continue with the Windows OS installation.

m. After Windows OS Installation is completed, the system will automatically reboot.

Appendix E

System Specifications

Processors
Single Intel E6000 & E4000 sequence, PentiumD (Dual-Core), Pentium4 Extreme Edition, Pentium 4, Pentium Extreme Edition and CeleronD LGA775 processors at a FSB speed of 1066/800/533 MHz

Note: Please refer to the motherboard specifications pages on our web site for updates on supported processors.

Chipset
Intel 3010 chipset

BIOS
8 Mb Phoenix® Flash ROM

Memory Capacity
Four 240-pin DIMM sockets supporting up to 8 GB of unbuffered ECC or non-ECC DDR2-667/533/400 SDRAM

Note: See the memory section in Chapter 5 for details.

SCSI Controller (5025M-4+)
Adaptec AIC-7902 for single channnel, Ultra320 onboard SCSI

SCSI SCA Backplane Controller (5025M-4+)
QLogic GEM318 controller for SAF-TE compliance

SCSI Drive Bays (5025M-4+)
Six (6) drive bays to house six standard **1" 80-pin** SCA SCSI drives

SATA/IDE Drive Bays (5025M-i+)
Six (6) drive bays to house six SATA or IDE drives

Peripheral Drive Bays
One (1) 3.5" floppy drive
One (1) slim CD-ROM drive

Expansion Slots
Oone PCI-Express x8 slot, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and two 64-bit 100 MHz PCI slots

Motherboard (5025M-4+/5025M-i+)
Model: PDSM4+/PDSME+
Form Factor: ATX
Dimensions: 12 x 9.6 in (305 x 244 mm)

System Input Requirements
AC Input Voltage: 100-240V AC
Rated Input Current: 7A (115V) to 3.5A (230V)
Rated Input Frequency: 50 to 60 Hz

Power Supply
Rated Output Power: 550W (Part# PWS-047)
Rated Output Voltages: +3.3V (30A), +5V (33A), +12V (42A), -5V (0.8A), -12V (1A), +5Vsb (2A)

BTU Rating
2903 BTUs/hr (for rated output power of 550W)

Chassis
5025M-4+:
Model: SC823S-550LP
Form Factor: 2U rackmount
Dimensions: (WxHxD) 16.7 x 3.5 x 25.7 in. (425 x 88 x 652 mm)

5025M-i:
Model: SC823i-550LP
Form Factor: 2U rackmount
Dimensions: (WxHxD) 16.7 x 3.5 x 25.7 in. (425 x 88 x 652 mm)

Weight (5025M-4+/5025M-i+)

Gross (Bare Bone): 55/54 lbs. (25/24.5 kg.)

System Cooling

Four (4) 8-cm fans (FAN-0070)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:
FCC Class B, EN 55022 Class B, EN 61000-3-2/3-3, CISPR 22 Class B

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)

Notes